The Journal

OF THE KANSAS MEDICAL SOCIETY

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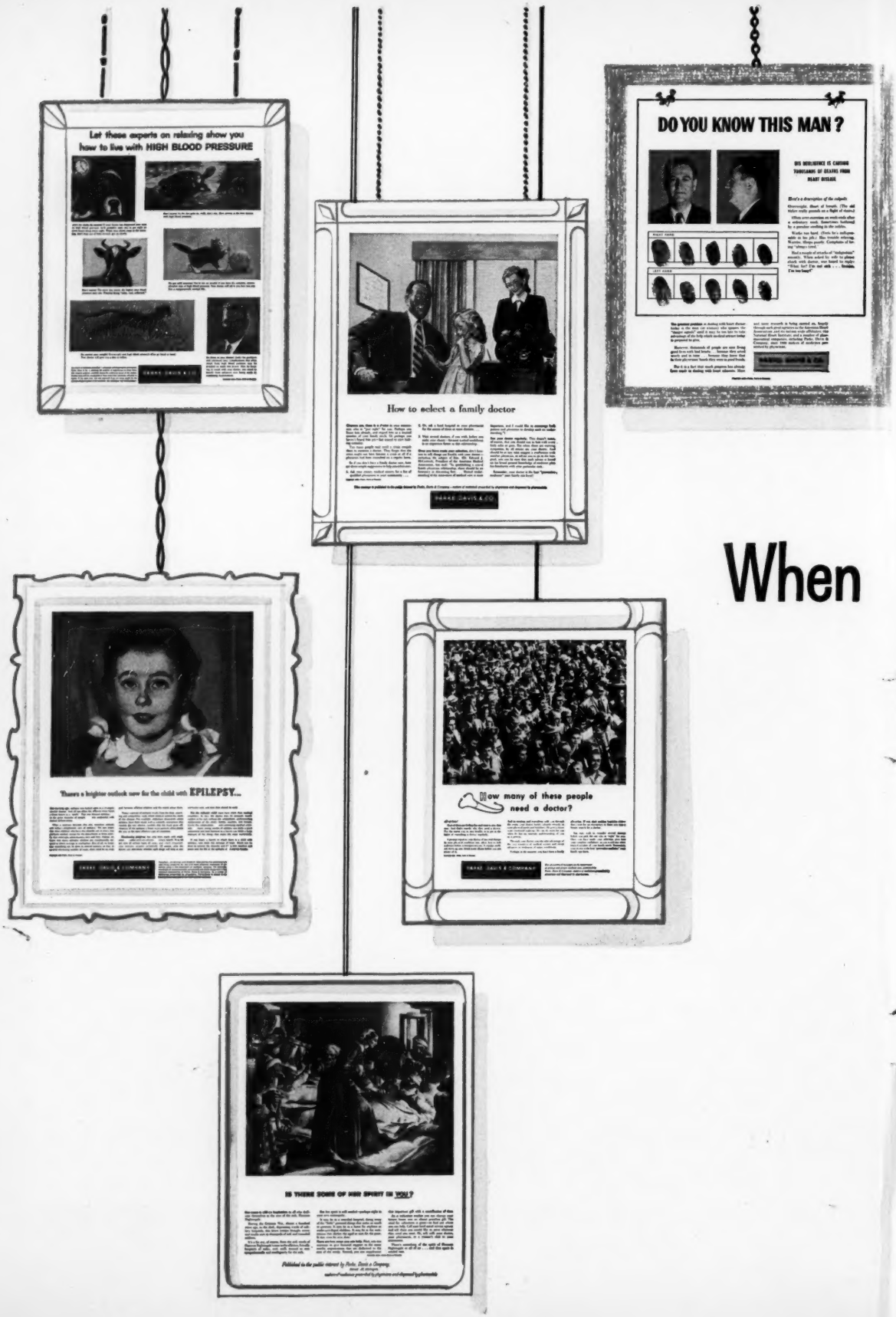
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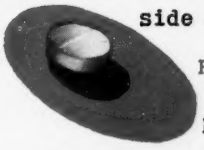

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Evidence indicates that long continued extremely low fat intake in adults is incompatible with good health.[4,a] In addition to protecting tissue protein against catabolism for energy needs (the protein-sparing action of fat), sufficient amounts of fat in the dietary promote storage of protein.[4,b] In a normal mixed diet, fat is about 95 per cent as efficient as carbohydrate for production of muscular work.[4,c]

Neither the optimal level of fat in the diet nor the optimal range for apportionment of fat and carbohydrate to meet calorie allowances is known.[1,2]

Contrary to general impressions, fat in the mixed diet is effectively digested.[4,d] In moderate amounts it does not appreciably influence the digestibility of other foods.[5] Fat enhances the satiety value of meals, and foods naturally containing fat and those prepared with fat add much to the flavor value of meals. High fat diets sometimes are useful in alleviating constipation.[6]

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1. Goldsmith, G. A.: Application to Human Nutrition, in Bourne, G. H., and Kidder, G. W.: Biochemistry and Physiology of Nutrition, New York, Academic Press Inc., 1953, chap. 23, p. 505.
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Investigators[1,2] have found that as the body attempts to adjust itself to declining estrogen production, a number of symptoms may appear which call for the prompt institution of estrogen replacement therapy. These symptoms may be nervous, circulatory, arthralgic, or dermatologic in character because the loss of ovarian hormone "withdraws one of the most important metabolic regulators of the organism"[3] and affects many body functions. If such metabolic imbalance or deficiency is evidenced, the administration of estrogen is clearly indicated.

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1. Werner, A.: Acta endocrinol. *13*:87, 1953.
2. Malleson, J.: Lancet *2*:158 (July 25) 1953.
3. Goldzieher, M. A., and Goldzieher, J. W.: Endocrine Treatment in General Practice, New York, Springer Publishing Company, Inc., 1953, p. 23.

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Veriloid is supplied in 2 mg. and 3 mg. slow-dissolving scored tablets. When used as sole medication, initial daily dosage is 8 or 9 mg. in divided doses, not less than 4 hours apart, preferably after meals.

When used in combination with other antihypertensive drugs, the dosage of Veriloid may be reduced by as much as 50%.[1]

1. Allen, E.V.; Barker, N.W.; Hines, E.A., Jr.; Kvale, W.F.; Shick, R.M.; Gifford, R.W., Jr., and Estes, J.E., Jr.; Proc., Staff Meet. Mayo Clin. *29*:459 (Aug. 25) 1954.
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	Vestibular damage % of patients		
	Mild	*Moderate*	*Total*
Streptomycin	12	6	18
Dihydrostreptomycin	6	0	6
Distrycin	0	0	0

	Cochlear damage % of patients		
	Mild	*Moderate*	*Total*
Streptomycin	0	0	0
Dihydrostreptomycin	12	3	15
Distrycin	0	0	0

**Heck, W.E.; Lynch, W.J., and Graves, H.L.: Acta oto-laryng. 43:416, 1953.*

Distrycin dosage is the same as for streptomycin. In tuberculosis the routine dose is 1 Gm. twice weekly, in conjunction with daily para-aminosalicylic acid or Nydrazid (isoniazid). In the more serious forms of tuberculosis, Distrycin may be given daily, at least until the infection has been brought under control.

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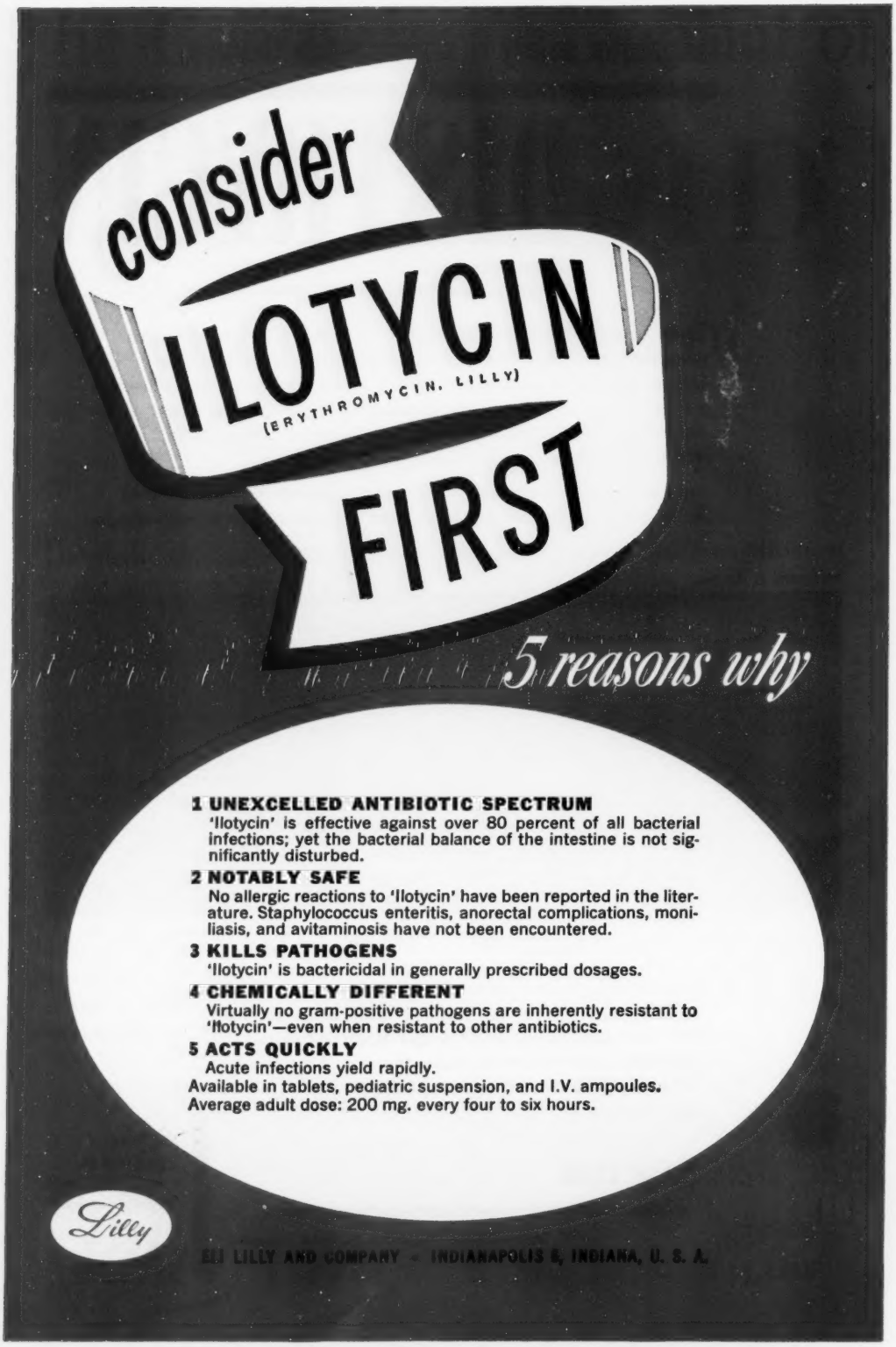
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Volume LV NOVEMBER, 1954 No. 11

Medical Care in Pediatric Surgery

Frederic Gerard Burke, M.D.
Washington, D. C.

Infants and children are frequently regarded as miniature men and women, both in the general practice of medicine and in surgery. Consideration of the factors of immaturity and growth and development attest to the incorrectness of this viewpoint. During the first few years of life, the patient is characterized by markedly immature but very active physiologic processes and rapid metabolism, necessitated by the acceleration of growth. There is a particular instability of the mechanisms that control water, acid-base, and nitrogen balance.

The younger and more immature the infant or child, the more rapid the extensive changes that occur in physiochemical disturbances of the normal balance of tissue fluids. Normally, the quantity of circulating plasma is remarkably constant, but under conditions of disease, changes in the volume and composition closely reflect the changes of the fluids in other compartments. There are many mechanisms with a remarkably standard pattern under abnormal states which are activated to conserve body fluids and minimize loss of water. These changes are characterized primarily by shifts in the concentration of the various water holding salts within their respective compartments.

Since serious surgical disorders result in dehydration, alkalosis, acidosis, and in anemia, the pediatric surgeon and the pediatrician must reckon with these changes in the management of a sick child if optimal results are to be obtained. As important as these factors are in the preparation of the adult for surgical procedures, the liability and immaturity of these balancing mechanisms in children make their adjustment of greater importance. Of course the arithmetic majority of surgical procedures performed in children, such as hernia repairs and eye, ear, nose and throat operations, seldom require any parenteral fluid therapy. Indeed, minor shifts of acid-base and fluid balance are best "intelligently neglected" since the body reserves can be depended upon to compensate satisfactorily any minor shifts. When the oral intake is reduced or fluid losses are excessive, as by vomiting, enterostomy, diarrhea, fever, etc., then these losses must be replaced, usually by parenteral routes. In general, there is more hazard in over hydration by excessive and enthusiastic infusions of fluids in surgical disorders in children than in not supplying enough; so great care and close observation must be employed in supplying parenteral repair solutions.

Physiologic salt solution is frequently used in fluid replacement therapy of children, and if the kidneys are functioning normally, it helps to correct alkalosis or acidosis. Excessive amounts, particularly in young babies and in other children with decreased renal function, may lead to edema on the basis of sodium retention.

The various modifications of Ringer's solution with magnesium, calcium, and potassium added are most valuable in correcting water and salt loss. Hartmann's solution contains sodium lactate in addition to the other ions of Ringer's solution and is more effective in correcting acid-base imbalance associated with dehydration. Glucose should be used in conjunction with Hartmann's-Ringer's solution when ketosis is present, and it is well tolerated and utilized as a 10

Presented at the 75th annual session of The Kansas Medical Society, Topeka, May 2 to 6, 1954, in panel discussion on Pre- and Postoperative Care of Infants and Children. Participating in this panel were Frank L. Menehan, M.D., Wichita, Moderator, and David R. Akers, M.D., Denver.

Professor of Pediatrics, Georgetown University, Washington, D. C.

per cent solution when given intravenously or as a 5 per cent solution subcutaneously. Five or 10 per cent glucose with Hartmann's solution added is probably the safest parenteral fluid employed in helping restore the mineral and caloric imbalance in pre and postoperative care, when the need for fluid and minerals has been determined.

Whenever possible, the oral route for hydration is by far to be preferred, particularly in reference to caloric restoration. Fluids can also be supplied by rectum such as retention enemas and subcutaneously with the assistance of hyaluronidase to facilitate absorption. Whenever parenteral fluids must be employed over a period of several days, there is considerable advantage to a cut down with the insertion of polyethylene tubing, which permits much greater and more efficient control over the fluid intake.

The effects of hypoproteinemia are many and well known. The hypoproteinemic child is more susceptible to infection, and when infection supervenes the course is apt to be stormy and protracted. Children who, prior to development of a surgical disorder, are suffering from a protein deficiency, develop an aggravation of this condition during the disease process and may succumb even in the face of bacteriologic control by antibiotics because of the severe decrease of tissue and plasma proteins. Furthermore, such a child is more susceptible to shock, and postoperatively he may suffer from delayed rate of healing. Also, his chance of developing a postoperative adynamic ileus is increased. Stomal difficulties, chronic anemia, and intestinal obstruction are more likely to occur when blood proteins are low. The development of ascites and the effects of hypoproteinemia in hemorrhage, burns, peritonitis, and obstruction are well known.

When possible, protein should be supplied by mouth. In infants, when the intake falls below 2.2 grams per kilogram of body weight, a negative balance is to be expected.

Amino acid solutions may be used to control and maintain nitrogen equilibrium, usually as a 3½ per cent solution combined with dextrose, and may be given to children who for one reason or another cannot take adequate amounts of protein by mouth. Of greater value than amino acid solutions is human plasma or human albumin to help restore normal protein values of the blood. They are particularly useful when the alimentary tract is obstructed as in atresias, pyloric stenosis, intussusception, volvulus, peritonitis, or when the intestinal tract should be kept at rest during the postoperative course of abdominal surgery. The value of plasma and human albumin in restoring circulating volume while raising the intravascular osmotic pressure is well known in the management of the adult surgical patient and is equally valuable in children.

Blood transfusions are indicated for the replacement of blood lost by hemorrhage and are considered essential when the hemoglobin content is below 9 grams per 100 cc. Blood loss at the time of operation, if it is more than a minor degree, should be replaced before the patient leaves the operating room. The frequently noted beneficial effects of small repeated blood transfusions in the postoperative course of children convalescing from a serious surgical disorder justify the use of blood even though the hemoglobin and red blood cell counts have slightly higher values. This effect has been attributed in part to naturally occurring antibacterial factors in adult blood in addition to its immediate value as a valuable source of protein, minerals, and oxygen-carrying properties of the red blood cells.

Vitamin K should be administered to the newborn before and after surgical procedures to help circumvent hemorrhagic diathesis, and attention should be paid to the calcium and Vitamin C intake, particularly in early infancy.

Because of the ever present danger of concurrent or postoperative infection, the use of antibiotics and chemotherapeutic agents just before and following major surgical procedures is frequently advisable. When the hazard is respiratory infections, a single injection of a long acting, depo-penicillin such as bicillin may have considerable prophylactic benefit. Terramycin or chloromycetin may provide considerable protection when bowel surgery is performed. Whenever time permits in the instance of elective intestinal surgery, such as in Hirschsprung's disease, reduction in the bowel flora is recommended by the use of the broad spectrum antibiotics.

Morphine as preoperative preparation before anesthesia has been much maligned in pediatric practice, and the dangers have perhaps been unduly emphasized. In small doses effective relaxation is possible with a safety margin that is not too narrow. It is not necessary in infants up to the age of 4 or 5 months, but after 6 months it is a valuable aid in securing relaxation. The doses recommended begin at 1/144 of a grain at the 6-month level and increase to 1/48 of a grain at the 3 to 5-year level. Where there might be difficulty in securing these small graduated doses, the danger of central respiratory inhibition, due to the possibility of using a greater dosage than is necessary, might constitute a contraindication to its use.

The preoperative use of atropine or scopolamine in combination with morphine is of considerable assistance in providing a smooth anesthetic. Fear and apprehension are diminished, secretions are reduced in amount, untoward and dangerous vagal reflexes are rendered less hazardous, and the induction is made smoother. Whenever possible, barbiturates should be given the night before the operation and 1 to 2 hours

preoperatively to help reduce psychic trauma associated with the operative procedure.

Conservation of body heat in young infants during the operative procedure is a point which cannot be overemphasized. The use of an electric heating pad or hot water bottles around the infant's body, particularly during prolonged operations, reduces the chances of shock and minimizes the danger of postoperative infection. Oxygen therapy and measures to maintain a normal body temperature are important supportive procedures, as are suction facilities for the nose, throat, and stomach during the period of time immediately after the operation.

These points that have been mentioned are general points which are of particular interest to the pediatrician in his phase of responsibility in the management of a surgically sick child. In each or any specific condition, any phase of surgical stress may assume particular or peculiar significance. The best preoperative preparation in the world is a poor substitute for early and accurate diagnosis. For example, in pyloric stenosis, the relative safety and success of surgical correction is attested to by its general acceptance as the method of choice for the treatment of this condition. In adequate hands, the mortality rate attendant to this operaion should be no higher than 1 per cent. Consideration of the physiochemical equilibrium and fluid balance of these infants before and after operation would give promise that this mortality will be kept at a low rate.

In no instance should an infant be operated upon for pyloric stenosis without satisfactory preoperative preparation. This consists of adequate hydration, correction of any existing anemia by blood transfusion, and correction of alkalosis by the parenteral administration of Ringer's solution and glucose. Probably the two most important factors responsible even for the existing mortality are failure to adequately prepare these patients for operation and failure to institute surgical procedures early.

It is well known that severe alkalosis can result in generalized convulsions and in fatal depression of respiration in the small infant. The tetany that results from alkalosis should be relieved by restoration of acid-base balance and the intravenous administration of calcium gluconate. This balance can nearly always be restored by the intravenous administration of salt solution. Surgical correction of pyloric stenosis is never an acute emergency, and restoration of homeostasis and caloric equilibrium is essential to its successful outcome. Because these infants are actually in a state of starvation, external heat should be constantly applied before, during, and after operation. Formulas should be withheld for at least 12 hours because of the frequency of postoperative vomiting, and at that time half-strength breast milk or a weak acidified evaporated milk formula can be employed in small amounts at three- to four-hour intervals.

One final area of interest to the pediatrician which is of considerable importance in elective pediatric surgery is selection of the time to operate. While the location and nature of the defect that clearly indicates prompt surgery offers no problem in timing, there exists a difference of opinion as to when to operate when conditions exist that apparently do not offer an immediate threat to life.

An example is the inguinal hernia. Most textbooks still have elaborate diagrams of ingenious devices calculated to truss the anatomically weak point in the inguinal region. Trusses for this purpose probably have no valid use and should be discontinued except in the rare case. There is a bad psychologically deterrent effect upon the young mother who lives in constant fear of strangulation of the hernia, which has its effect not only on the parents but also on the infant. Too often these babies are pampered and given everything they want or think that they want to prevent them from crying, the parents appreciating that the increased intraabdominal pressure resulting from crying causes the hernia to descend. While an occasional inguinal hernia will spontaneously heal during the first year, it is doubtful that any inguinal hernia will heal spontaneously after the first year. Even if incarceration has not occurred before the 12th month, surgical repair should certainly be instituted. If incarceration occurs any time after birth, surgical repair, not a truss, is the correct management. In most cases today, inguinal hernias should be surgically repaired when it is definitely ascertained that one is present.

Plastic surgery, cardiothoracic, urologic, and orthopedic defects all offer specific problems in timing, and consideration of the peculiar factors of growth and development, not only of the body but also of the personality, that characterize the infant and child should help in the selection of the time for surgical correction.

In summary of this general outline of some of the principles of medical management of the infant or child who is a candidate for a surgical operation, it is well to keep in mind that the operation represents only one specific phase in a treatment regime that does not lose sight of the patient as a whole. As important as good surgical technique is to the successful outcome, failure to give keen attention to medical factors offers a serious threat to good results.

These factors are:

1. Hydration. This consists of the administration of parenteral fluids, if the oral route is not available, with particular reference to selection of the correct fluid, route, rate, and technique of administration.

2. Restoration and maintenance of caloric, nitrogen, and acid-base balance.

3. Measures to conserve body heat, relieve apprehension and pain, and prevent psychic trauma by the use of barbiturates and morphine.

4. The restoration of a normal blood picture by the use of small, repeated blood transfusions.

5. Measures calculated to control and prevent infection by the use of antibiotics.

6. Symptomatic and supportive therapy as indicated by the particular case, including the use of oxygen and suction facilities for the nose, throat, and stomach.

7. Consideration of the factors of growth and development to assist in the selection of the best time for the institution of elective surgery.

A General Practitioner Studies Psychiatry

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INTRODUCTION

During the Kaw River flood in 1951 the author, who at that time had completed two years of psychiatric training after eight years of practice in general medicine and surgery, was again temporarily thrust into a busy general practice in a Topeka dispensary caring for flood victims. In reflecting upon this experience, this former general practitioner became aware of how much psychiatry can add to the physician's understanding of the ailments of many patients.

This paper will present five case examples, drawn from the brief dispensary experience, in which the physician's psychological awareness, nurtured by additional training, provided the clue to diagnosis or to further understanding of the patient's problem. The emergency nature of the dispensary was such that follow-up was not possible, and this paper therefore can only concern itself with what the author considered to be a broadening of his own conceptual sphere and various observations and suggestions drawn from this consideration.

CASE REPORTS

Case 1. A 64-year-old woman came to the dispensary to request a medical order that she be served her meals on a tray. She stated that weakness in her legs made it difficult for her to stand in line in the dining room. The nurse (to whom she had first complained, as was customary in the dispensary) was impatient with the woman's request for special privilege, particularly since the patient did not appear acutely ill and had indeed walked to the dispensary without help.

The doctor observed a weather-beaten old woman who sat quietly and spoke only to answer direct questions, except to volunteer that she thought one tray a day would be enough for her. Her facial expression was paradoxical, with a troubled forehead but a steady smile.

It was noted that her pulse was slow, whereupon she stated that she had been taking digitalis for several years. She had, however, before the flood, managed her home, done all her own shopping, and chopped wood. Except for the leg weakness, she had experienced no recent symptoms of cardiac decompensation. A general physical examination seemed to confirm the impression gained from the history that her cardiac and general physical status had not recently changed.

I then asked her how she had been affected by the flood. Tearlessly and still smiling, she slowly developed the story that she had lived alone in her own little home, but that it, with all her possessions, had been carried away by the flood. It became apparent, as she spoke, that this otherwise properly oriented woman had not fully assimilated the meaning of the enormous tragedy which was hers. Her mien and quiet, unspontaneous manner reflected her effort to hide the implications of the catastrophe from herself. Her complaint of weakness of the legs, however, clearly told of her burden through the one medium of expression available to her then. Treatment consisted simply in providing this woman with the special care she requested and an opportunity to work out her future plans with the help of a social worker.

Case 2. A young man of 26 years of age who had patiently awaited his turn, when finally asked about his problem, said he would like a prescription for athlete's foot. He slowly took off his shoes and socks. Between several toes was a typical, mild, chronic epidermophytosis. He stated that he had had the condition for several years and had never previously asked for treatment. In the situation of a busy dispensary crowded with many seriously ill patients, his minor complaint seemed out of place, and indeed the suspicion arose that he was simply using it as an

opportunity to get free medical advice. However, as the prescription was being written, he was asked a few general questions about himself.

From his wistful manner and the dependent way in which he related himself to the physician, it became clear that this young man felt lost and alone in the vast impersonal flood relief operation. He had actually come to the dispensary to get a few minutes of the kind of attention which he knew he would get from a doctor. He came for sustenance to stave off the feelings of loneliness and anxiety which were beginning to well up within him. The physician, aware of the patient's real reason for coming to the dispensary, was able, simply through his attitude and the quality of his attentiveness, to meet some of the patient's need within the time it took to prescribe and to outline treatment for the athlete's foot.

Case 3. A girl of 9, quiet, pale, and immobile, was seated between her parents. As the doctor approached, she turned her head sideways. The parents stated that she was suffering from "sinus" headaches. A general physical examination including transillumination was negative. She was not anemic. Her parents spontaneously went on to say that three months earlier a doctor had diagnosed an acute sinus infection.

In reply to direct questioning, they reported that since that time the girl had been free of headaches until the family was evacuated from their home three days previously, at which time the "sinus" returned. The child had not had a recent cold or fever. The parents, during the questioning, peculiarly continued to assume that the girl was suffering from a sinus infection and that the headaches were unquestionably on that basis. It was as though they could not talk about anything else and had to believe that "sinus" was responsible for their girl's trouble.

They were induced, however, to talk about other matters and finally mentioned that since the flood two siblings of the patient were unaccounted for. With an expression of dawning insight, the mother stated that their girl had been much troubled about her siblings but that they had asked her not to talk about this matter. The mother herself then suggested that perhaps the headaches were caused by worry about the siblings. The physician agreed with the mother, encouraged the parents to allow the girl to talk freely, suggested that they take her to the park for active play, and referred them to the Red Cross for help in locating the other children. The parents left cheerfully and considerably relieved.

Case 4. A woman who accompanied her 10-year-old niece stated that the child was suffering from upper abdominal pain. The girl herself sat quietly with her hands folded as the aunt listed the symptoms. Examination was negative, and in particular there seemed to be no basis to substantiate the diagnosis of gastroenteritis or other infectious or organic disease. The aunt was then further questioned about the girl's circumstances, and it turned out that the patient and her five siblings were living with their parents in a damp, crowded basement. The family had hurriedly left their flooded home, leaving behind all of their nicer clothing and personal possessions. The patient had not only lost these items, but had also lost a teddy bear of which she had been extremely fond.

In addition to living in an unpleasant small enclosure, the children were forced to remain heroically quiet and well-behaved in order not to jeopardize the family's place in the home where they were now living. As the aunt related the story, particularly about the loss of the teddy bear, tears came to the girl's eyes. It was clear that the child's loss, and the necessity to control her feelings, were responsible for her stomach pain. Simply bringing out the above facts in the course of understanding the problem and permitting the child to cry, served in this instance to relieve her pain.

Case 5. A 24-year-old man was seen rolling from side to side on a cot, holding his hands to his abdomen and groaning. When asked what his problem was, he replied, "My stomach." General physical examination was negative. After the examination he was asked, with firm conviction, "What is *really* bothering you?" He promptly replied, "I can't reach my family."

He told a story of working 48 hours on the dikes, of collapsing from fatigue, resting an hour, and then working 24 hours more. He told of his concern that he couldn't reach his family to find out how they were. Almost immediately after beginning to talk, his abdominal pain disappeared, and after 10 more minutes he asked for some food although he previously had been unable to eat.

DISCUSSION

The author was aware, before he undertook residency training in psychiatry, that many of his patients were under psychological stress of one kind or another. Like every other general practitioner, he had some conception of the financial, social, or family difficulties of his patients, but it was difficult for him to ask directly about such matters and investigate them as openly as he examined an infected finger or surgical wound. He felt that to probe into "personal" matters on the assumption that these contributed to fatigue or abdominal discomfort (implying, of course, that psychological factors were involved) was, compared with concern about purely physical matters, a relatively forbidden territory. Such questioning threatened to evoke the hostility of the patient who might interpret it as a violation of his privacy.

But the physician's fear of the patient's response in

these matters is like the hesitation of the medical student in doing a rectal or vaginal examination. With experience and knowledge comes the conviction that such "probing"—if done gently—is necessary. In addition, the patient can better co-operate with the procedure if the doctor feels comfortable about doing it. With psychiatric experience, the physician becomes increasingly comfortable in dealing with the thoughts, wishes, fears, and fantasies of his patients, as he becomes convinced of their importance. (See Case 5—"What is *really* bothering you?")

In the course of psychiatric training the physician becomes increasingly aware of the diagnostic importance of attitudes, postures, facial expressions, mannerisms, ways of speaking, etc. (See Case 1—the troubled forehead, the fixed smile, and the unspontaneous manner.) Likewise, he comes to understand that inappropriate behavior may be a significant clue to the psychological meaning of the symptom for the patient. Thus, the patient who calls the physician at night for an apparently minor ailment or, as in Case 2, the young man who came to a busy dispensary crowded with acutely ill patients, asking for treatment of a chronic athlete's foot, may be indirectly indicating what the treatment should be. What is it that the patient really wants? Why was it that the little girl with headaches (Case 3) turned her head away from the physician? It seemed probable to the physician that she felt guilty because part of her wanted to have her parents to herself, without the competition of siblings. In the cases cited, the patients presented the kinds of complaints the busy doctor sees daily, and the little signs mentioned furnished the clues for diagnostic formulation.

Many physicians find it difficult to observe behavior as objectively and with the same diagnostic interest as they observe other medical phenomena. Particularly irritating are the patients who depreciate the physician, refuse to have surgery or to follow directions, who move from one doctor to another, who don't appear for appointments, or who don't get better but keep coming back with the same or with more involved or elusive complaints. These and other behavior manifestations are symptoms which are just as significant in the diagnosis as a skin rash or leukocytosis.

It is true that the physician himself may have entered into the elaboration of a symptom by unprofessional conduct or by unwittingly stirring up fear, dependency, or other feelings in the patient; nonetheless, whatever the patient says or does is still a manifestation, a sign or symptom, of his illness, to the extent that his own personality is reflected in the illness. Whether or not the matter in question can be handled by talking about it with the patient, as it often can be, the doctor is not so likely to be irritated by such behavior if he is able to look upon it as a symptom rather than as a personal insult.

The roots of the patient's response to the doctor undoubtedly lie, in part, in hostile or affectionate feelings which existed much earlier in life toward the father or other important figures and which are now transferred onto the person of the physician. The ramifications of the subject are beyond the scope of this paper, but the point of the matter is that the physician can maintain a certain degree of objectivity and comfort by observing all behavior—sympathetically, to be sure—in the same light as all other medical phenomena.

These general observations suggest certain key questions which the practicing physician may find useful in orienting himself to psychological factors in the patient's illness. First, why did the patient really come to the doctor? Granted that the presenting complaint should have medical attention, or that the patient is uncomfortable, what is it that he really wants from the physician? Translating what the patient says into what he means is one of the major skills of psychiatry and related disciplines. It is a skill possessed in varying degrees, of course, by all students of human nature, but it can be developed by observation and training, and it is a skill which can be extremely useful in general medicine. The key question may be phrased in other ways: "Why did the patient really come to me at this time?" "What is he actually trying to say to me?" "Are his complaints covering up concern about something else? If so, what is it?"

Second, as the patient speaks of his illness, are his attitudes and feelings appropriate to the seriousness of the complaint? Does he seem overly concerned or too little concerned? Does he seem odd, peculiar, or even bizarre? Does he take delight in repeatedly describing his troubles? Does he volunteer that he wants surgery before the physician has even considered such a procedure?

Most patients should give a straightforward story, and their feelings and mood should be reasonably appropriate to the complaint. The neurotic or psychotic patient will probably behave otherwise. A vague or incoherent recital of symptoms may mean that the physical complaints are a front for deeper emotional problems. The patient with an early or mild depression may seem more pessimistic or be more preoccupied with his physical complaints than is warranted by their seriousness. The early or incipient schizophrenic may make a peculiar request of the doctor, as for example a young man in the author's general practice who, in a deeply troubled mood, asked that the doctor remove (normal) "bumps" from his forehead. Many schizophrenic patients request or attempt castration, while others attempt to secure castration symbolically

by seeking surgery on the face, nose, or teeth. Neurotic patients may request surgery for other reasons, at the same time treating the matter quite lightly, or becoming angry if the doctor hesitates. The attitude and mood of the patient, therefore, may be as diagnostic as other findings, and if inappropriate should give the physician pause. Unfortunately, surgery or even prolonged preoccupation with physical aspects of illness may aggravate the underlying emotional problem.

Third, what is the patient's response to the following remark: "It occurs to me that something may be troubling you, which you haven't yet mentioned." This question is useful when the physician suspects that emotional difficulties underlie the presenting complaint. Some patients are grateful at such an opportunity to talk, or may suddenly begin to cry. This reaction clearly confirms the doctor's suspicion, whether or not the patient goes on to explain why he is crying. Another patient may too vigorously deny that anything else is on his mind. The vigor of his denial likewise confirms the doctor's supposition. If the patient is able to mention other troubles, these may range, of course, from an unexpressed but realistic fear of cancer to the unrealistic fear of poverty which is so characteristic of the melancholic. If the physician has treated other members of the family, he is in a strategic position to guess at or to suggest what might be troubling the patient.

The above questions are a few which may help the doctor find the patient behind the presenting complaint. They supplement but do not take the place of a careful physical examination and necessary laboratory studies. The point of these questions is that to leave out entirely a psychological examination is like making a diagnosis on the basis of the history alone. The questions do not provide the basis for a thorough psychological examination, but they do provide a kind of psychological screening which is possible in a busy practice, and they do orient the physician to psychological factors in the majority of his patients and, in general, make the total examination far more complete.

CONCLUSION

The author, formerly a general practitioner, has commented on lessons learned during the study of psychiatry which he found useful when he temporarily returned to general practice. An effort was made to relate these lessons to actual case material. Questions have been suggested which may be useful to busy physicians in their efforts to visualize the larger problems behind the presenting complaint. Not included in this paper is the author's self-searching, which accompanied the care of these patients. How did he handle similar problems before he had had additional psychiatric experience? Some of the self-searching is reflected in the discussion, but as to the rest the author can only suggest, individual differences being what they are, that the reader conduct his own self-searching. Also not included in this paper is any reference to what other physicians have discovered for themselves along the lines of the topics discussed in this paper. It is basically a testimonial as to what intensive psychiatric training added to the day-to-day professional armamentarium of one general practitioner.

Historical Material Needed

In preparation for the observance of The Kansas Medical Society's centennial anniversary, members of the Committee on History are attempting to collect all material of historical interest. Physicians who can contribute information, records, etc., are urged to send such to

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Congenital Absence of the Vagina: Review and Case Report

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Congenital absence of the vagina, although not a rarity to the literature, is unusual in the ordinary physician's practice. The first case reported in the literature was by Realdus Columbus in 1572.[4] Engstadt[4] stated that vaginal aplasia occurs once in every 5,000 female births. Bryan et al.,[2] in reporting a series of 100 cases, found an incidence of one in every 4,000 female patients. Owens[15] found only six cases on 502,081 hospital admissions over a 34-year period at Charity Hospital in New Orleans.

One has only to talk a short time with one of these unfortunate patients to realize the mental state that results when these females find that they lack the necessary anatomy for happy and successful married life. Psychological reactions range from assumed complete indifference to severely depressed mental states with, in some cases, suicidal tendencies. All of these individuals possess a profound feeling of inferiority which over a period of time can produce complete emotional instability.

HISTORY OF TREATMENT

Attempts at correction of this malady go back many years. Depuytren[4] in 1817 is credited with the first attempt at construction of an artificial vagina. He separated the urethrorectal septum and inserted plugs, hoping for epithelialization. His results were disappointing. In 1872 Heppner[10] introduced skin flaps which later contracted. Thiersch grafts were attempted about this time but likewise failed. Gersuny,[10] in 1897, transplanted the anterior wall of the rectum with fair results. Sneguireff[10] transplanted the lower portion of the rectum into the vaginal opening, but again his procedure did not stand the test of time.

In 1904 Baldwin[1] suggested an operation and carried it out in 1907 to a successful conclusion. This consisted of isolating a loop of ileum and reestablishing intestinal continuity. The double loop of isolated ileum was then pulled down between the urethra and rectum. At a later date the double-barreled vagina was made into a single canal by applying a crushing clamp. Needless to say, in 1907 this required unusual skill. Daniel[10] reports a mortality of 17½ per cent in 79 recorded cases. This figure is doubtless low as many cases were probably not recorded in the literature.

Another procedure was devised about this time which carried a lower mortality. This was devised by Poppoff, Schubert and others.[10] It consisted of liberating the lower portion of the rectum and transplanting it into the urethrorectal septum, pulling the sigmoid down, and uniting it to the remaining portion of the rectum. Although the mortality with this procedure was less, disagreeable sequelae such as rectovaginal fistulae resulted fairly frequently.

Pedicle flaps were next to be used in the construction of a vagina. Jewett[10] in 1904, Graves[10] in 1921, Charbonnel[10] in 1921, and Fraenkel[10] in 1924 all used portions of skin in flaps from the hymen, fourchette, and vulva. These were united and invaginated into the preformed canal and held in place by packing or plugs. Annoying things such as hair growth in the canal and tendency toward atresia and obliteration resulted. The continuous wearing of an obturator was required to keep a patent vaginal vault.

Full thickness grafts raised from the adjacent inner aspect of the thigh were next used. This procedure was used by Frank[10] in 1925 with good success. The use of obturators was required for several months to maintain patency of the newly formed vaginal canal. This procedure required a three-stage operation consisting of at least eight weeks of hospitalization.

In an attempt to simplify the procedure, Thiersch grafts were revived. These free grafts were sewed to the surface of a preformed obturator and this was inserted into the urethrorectal septum. Results were uniformly good, and this procedure has carried through to the present day as the procedure of choice in the construction of an artificial vagina.

Another procedure utilized with fairly good results today merely requires the opening of the vaginal space and keeping it open with some substance to permit the tract established to epithelialize without the use of skin graft. This is similar to Dupuytren's original attempt in 1817. Either petrolatum gauze or iodoform gauze packs were originally employed in conjunction with obturators of paraffin or balsa wood covered with a condom. From 1935 to 1940 Wells, Kanter and Wharton[18] used these methods with uniformly good results. Biopsy from the vagina postoperatively showed squamous cell epithelium. Wharton suggested that the epithelium from the urogenital sinus forms a large part of the fetal vagina, growing around the müllerian ducts, and that probably in his cases the epithelium arose from the rudimentary vagina.

PRESENT DAY CONCEPT

The use of the Thiersch or split skin graft is probably the procedure of choice in construction of the vagina. Simple reconstruction without the use of skin graft, allowing the space to epithelialize about an obturator, also produces good results in many cases. Which procedure to use becomes a debatable question at the time of surgery. Counseller[7] suggests that in those cases where the vaginal tract can be opened easily and without bleeding from the venous plexus on each side, and where there is no difficulty in reflecting the peritoneum, the simple insertion of the obturator can be used without grafting. Where these requisites are not met, probably the safer procedure is the use of the Thiersch graft. Counseller[7] further stated that in one of his cases he encountered a bud thought to be a remnant of the müllerian duct. This was excised, and biopsy revealed it to be squamous epithelium.

Counseller[7] also stresses an important point that would apply to both procedures, namely the "contraction factor." McIndoe is responsible for this contribution. He stated that the "contraction factor" of any canal lined by a split graft may last for three to six months or longer and if the obturator or mold is removed before this "contraction" disappears, stricture of the new canal will ensue. Thus most failures to achieve good results are probably due to removal of the mold too soon. It should be removed only for cleansing purposes and for examination of the vaginal canal. Otherwise, it should be worn for at least six months or longer.

A discussion of construction of the vagina would not be complete without mentioning the work of Frank.[9] In 1935 Frank[9] examined a case of agenesis of the vagina where a deep dimple was found, apparently the result of vigorous attempts at coitus. The patient was instructed to apply pressure with glass cannulas regularly, starting with a small diameter and increasing gradually in size. In a few weeks a 7½ centimeter vagina was established which remained patent. Frank reports eight subsequent cases in which this method was used, all with good results. In another report, Frank[9] gives follow-up data on some of these cases for two or three years, reporting that the vaginal canal persisted in spite of lack of routine dilatation. In case of married patients, satisfactory intercourse was experienced by both partners.

SURGICAL TECHNIQUE

Regardless of what procedure is used, other than the pressure method of Frank, the opening of the rectovesical space is not difficult. A catheter or sound should be placed in the bladder. The anterior rectal wall should be palpated, usually with an assistant's finger in the rectum. The vaginal space is identified. Either a transverse or vertical incision is made over the vaginal dimple through the mucous membrane midway between the rectum and the urethra. A well defined plane of cleavage is encountered between the rectum and the urethra. By blunt separation the bladder is pushed upward and the rectum downward. The peritoneum is soon encountered and can be easily rolled upward from the anterior rectal wall by blunt dissection.

The amount of bleeding encountered is in direct proportion to the success of the subsequent take of the split graft. Many of these spaces can be opened with almost no bleeding. It is important that the space be dry when the graft or obturator is inserted. The obturator is inserted, covered either with split graft or condom, and left in place for two weeks. During this time the patient remains in bed, is kept on a low residue diet, and has a retention catheter in place. At the end of 14 days the obturator is removed; the canal is inspected and cleaned; the catheter is removed, and the patient is allowed to be ambulatory and soon discharged from the hospital with the obturator in place.

UROLOGICAL PROBLEMS

Numerous urological abnormalities are frequently found with vaginal agenesis. Phelan[16] et al. report that in a series of 72 patients with vaginal agenesis urinary studies were performed and 26 showed urographic evidence of abnormality. These abnormalities consisted of renal agenesis of either kidney, renal ectopia, unilateral fused kidney, and ureteropelvic obstruction. One case of a pelvic kidney was found at laparotomy. Such a condition could pose a real problem from a standpoint of possible trauma in any surgical procedure in construction of the vagina. The fairly frequent incidence of such problems makes it of signal importance for anyone contemplating construction of a vagina to have a thorough urological examination and study of the patient.

CASE REPORT

Mrs. I. B.,* a 22-year-old white female, was first seen at the age of 16 years at which time she presented herself to her family physician because she had never menstruated. She was told at this time that she had no vagina and no uterus. At age 22 the patient had been married two years and her husband had died of pneumonia. During her two years of married life no attempt at sexual intercourse had been made. After the death of her husband she decided something should be done to construct a vagina if this were possible.

Physical examination presented a normally devel-

* The original surgery on this patient was done by the late Clyde O. Merideth, M.D., Emporia, Kansas. The case report is taken from the files of St. Mary's Hospital, Emporia, Kansas.

oped, pretty, white female. Findings were not unusual with the exception of the pelvic abnormality. The external appearance of the vagina was normal. When the labia were separated, no vaginal entroitus was evident. A normal appearing mucous membrane appeared over the area where the vaginal entroitus would normally be. Bimanual rectal examination revealed no uterus but normal ovaries bilaterally.

Surgery consisted of incising the mucous membrane in a radial direction from a central point. Incisions were carried radially at 12, 3, 6, and 9 o'clock, respectively, carrying the incisions out to the supposed hymenal edge. By blunt dissection the vaginal opening was made between rectum and urethra for a distance of 8 cm. Minimal bleeding was encountered. Points of epithelium from the radial incisions were then sutured into the vaginal tunnel. A small glass tube 8 cm. long and 2½ cm. in diameter was placed in the tunnel and fixed there, holding the skin edges against the vaginal wall. A retention catheter was placed in the bladder.

The patient's convalescence was uneventful, and she was discharged from the hospital five days postoperatively. She wore the glass tube for 12 days, at which time it was removed. She performed daily manual dilatation of her vagina and was seen twice weekly for several months by her surgeon, who also did normal dilatation of the vagina. She does not remember how many months this treatment was continued but supposes it was about six months. After this period of time she had no dilatation other than sexual intercourse.

The patient was first seen by us on November 13, 1953, with findings of acute appendicitis. She was admitted to the hospital, and an appendectomy was performed. At this time, through the paramedian incision, the pelvis was examined. A vestige of a uterus approximately 1 cm. in diameter was found. Normal Fallopian tubes with fimbriated ends and normal ovaries were found. At this time pelvic examination revealed completely normal appearing external genitalia and vaginal entroitus. Three fingers could be inserted into the vagina with ease. Depth of the vaginal vault was 8 cm. Vaginal wall was normal appearing with normal appearing mucosa. A small amount of normal appearing lochia was present.

COMMENT

This case is of interest in that it gives a follow-up over the course of years. This patient had her vagina constructed at 22 years of age. After being married for 8 years and at 32 years of age, she states her sexual life is entirely satisfactory. Being an intelligent person, she has quizzed her husband about his satisfaction from their sexual intercourse and reports he has been completely content. This patient stated that she has told her husband she has no uterus but has never told him she had no vagina and had one constructed earlier in life. She also states that she is conscious of each menstrual cycle; her breasts become sore and although she has no discomfort she experiences symptoms of pelvic fullness for several days.

CONCLUSIONS

A discussion of congenital absence of the vagina is presented with emphasis on the various methods of surgical correction. Associated urological problems are briefly discussed.

A case of congenital absence of the vagina with subsequent vaginal construction without use of skin graft is presented. Follow-up of the case in married life is also presented.

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Faith marches at the head of the army of progress. It is found beside the most refined life, the freest government, the profoundest philosophy, the noblest poetry, the purest humanity.

—T. T. Munger

The Widening Scope of the State Hospital, with Special Reference to Geriatric Medicine and Surgery

C. Maxwell-Joyner, M.D., and Rudolf Hofbauer, M.D.

Larned, Kansas Wichita, Kansas

During the past decade, as most of us know, a transformation has taken place in the care of our mentally sick. Stimulated by public opinion, the press, and their own convictions, authorities responsible for providing hospital care for the ever increasing numbers of mental patients have embarked on an impressive program to make these hospitals and this care ever more effective.

Trained psychiatrists, psychologists, social workers, special therapists, and other trained personnel are becoming more available for work in state hospitals. A veritable renaissance in the care of the mentally afflicted has thus taken place. Gone is the conception of the state hospital as a custodial institution only. Most mental hospitals are now alive with every activity conducive to the welfare and treatment of the mentally afflicted with programs directed toward their rapid rehabilitation and recovery.

Thus it has come about that a great expansion has taken place in the scope of the work done in state hospitals all over the country—in some hospitals to a greater degree than in others. Greater and wider responsibilities are being borne by them, and not the least of these is the care of physical infirmities from which mental patients, in common with other people, suffer. With increased life expectancy resulting from the discovery of antibiotics and impressive advances in medicine and surgery, more and more patients being admitted are elderly people who have thus been preserved but in whom the inevitable chronic disabilities of old age are present, such as arteriosclerosis, diabetes, hemiplegia, peripheral vascular disease, chronic heart and kidney conditions, and, in the surgical field, prostatism, hernia, fractures, uterine prolapse, hemorrhoids, and gangrene.

These physical disabilities have an important bearing on the mental condition of the patient; indeed, it may be stated that they are in certain cases the cause of the mental breakdown, as for example, chronic brain syndrome (arteriosclerosis). It is now being widely acknowledged that many senile infirmities with mental counterparts are conditioned by glandular failure, and many remarkable improvements in the mental state of patients have been recorded following the use of appropriate hormonal therapy.

In this connection we would like to mention the usefulness of the gonadotrophic hormones fortified with thiamin and glutamic acid in the case of male climacteric and senility, and fortified androgens in female senile cases. It is in this field, that of mental hospital practice, that our interests have been specially centered to see just how much can be done to improve the mental condition of the patient by alleviating or correcting any physical disease or disability.

Many psychoses, e.g. schizophrenia, cannot be explained on physical grounds and must be elucidated and treated by psychiatric and psychological methods. In many, psychoanalysis may well be the method of choice. It is now stated, however, that even schizophrenia is being stripped of its mysteriousness. Definite changes in the cellular chemistry of the brain cell of schizophrenics have been demonstrated and also changes in the blood (Houston Texas Research Center). Then we have general paresis, syphilis of the central nervous system, psychoses following surgery (prostatectomy, hip-pinning, hysterectomy, ovariotomy), childbirth, menopause, goiter, shock, carbon monoxide poisoning, etc.

We feel, therefore, here at Larned, that there is a big field for co-operation between the psychiatrist, the internist, surgeon, pathologist, biochemist, and psychologist. We are endeavoring to combine our resources and collaborate on each individual patient admitted to the hospital. While the patient is under the care of the medical and nursing staff, having the mental condition studied and worked up, a much more intensive physical survey is being conducted than was heretofore possible. The meshes of the net are being made smaller, and a great variety of pathological conditions, many of which have an important bearing on the patient's mental illness, are being found. A colleague of ours, the hospital radiologist, said he is surprised at the great number of pathological conditions he has observed in the roentgenograms he has studied and read.

It will be seen that a challenge and opportunity is presented to state hospital physicians who are working in the physician-surgeon section and whose duties embrace the fields of internal medicine, surgery, and pathology. The neuropsychiatrist simply has not the time to make adequate evaluation of the general physical condition of the patient. It is in many cases im-

possible to have investigation at outside clinics or hospitals for physical conditions in the mentally afflicted, for obvious reasons. Therefore, we consider it incumbent on the medical staff of the state hospital, helped by their consultants, to provide a service inferior in no way to that which could be obtained at a good hospital or clinic.

In the *Report of the California Department of Mental Hygiene,* 1950-1952, page 57, it is stated, "In order to provide good care, the mental hospitals *must* have the same facilities found in any general hospital, with a complete range of medical services to supplement the special facilities required to treat mental illness." . . . "The continual tensions, anxieties, frustration and resentment felt by the mentally ill patient show a heavy toll in *physical* as well as mental symptoms."

It has been said that, through the development of psychosomatic medicine, thanks to the researches of Cannon and others, we are coming to a realization that the emotions play a large part in the functioning of the various organs. W. Overholser in *Geriatric Medicine,* page 263 (W. B. Saunders, Philadelphia, 1944), states that there is a close relationship between the body and the mind. Metaphysics teaches that the mind is an epiphenomenon of the brain (my interpolation). In the past, internists and surgeons have been somewhat oblivious of this fact, and, in the same manner, the psychiatrist has erred in sometimes paying too little attention to some of the physical findings in his patients. Today, however, we find the psychiatrist, the internist, and the surgeon, as well as the various other specialists, meeting on a common ground and recognizing that they are dealing with a human being and that human being must be considered *in toto* rather than as an "assemblage of parts."

We feel that it is not sufficiently realized what a good medium the state hospital, with its generally large population, provides for research into chronic disease, medical and surgical as well as in neuropsychiatry, and we would like to draw our colleagues' attention to this aspect of state hospital practice. Many patients remain in state hospitals over prolonged periods, and this very fact gives a good opportunity to trace the course of chronic disease which may exist. Pathological processes can be followed, changes recorded, and followed through to autopsy or resolution. Definite contributions to geriatric medicine and surgery can thus be made, and this aspect of mental hospital practice should prove a stimulus to those doctors of the physician-surgeon group.

Not only is opportunity afforded for the sustained study of chronic illness, e.g. geriatrics, but screening programs for cancer, tuberculosis, and other diseases which have a definite public health value may well be undertaken by the medical staff. As an example of this type of work we would like to mention an investigation at present in progress at the Larned State Hospital into the incidence of cancer of the cervix uteri among the 500 aged female patients in this hospital. This investigation is a part of our general cancer program which has been in existence more than two years. It is based on the following:

1. Skin—Inspection
2. Oral—Inspection
3. Breasts—Palpation
4. Chest—Examination. X-rays, bronchoscopy, sputum examination for cells
5. Gastrointestinal—Rectal. X-rays, gastric brush method, washings, etc.
6. Uterus—Pelvic examination. Routine cervical cytology and biopsy
7. Prostate—Examination (rectal) with or without cytology.

This detection system is that advised by the Eugene Carey Cancer Foundation, Inc., 63 Wall Street, New York.

If there are abnormal findings, special investigations are then made to supplement this examination.

The following results from gynecological examinations made on 331 patients have been obtained. These female patients were not selected because of any suggestive symptoms, and were all presumably healthy.

	Number	*Percentage*
1. Cases showing positive cellular pathology for cancer of the cervix or endometrium, i.e., groups IIIB, IV and V (cytological grouping)	22	6.64
2. Cases showing suspicious cellular pathology, but where it is not believed that the patient has cancer of the cervix—group IIIA	40	12.08
3. Cases showing negative cellular pathology, i.e., groups I and II	269	81.26
4. Ring biopsies done to date on cases showing positive cellular pathology ..	14	
5. Ring biopsies positive for cancer of the cervix	4	
6. Positive ring biopsies in total number of positive cellular biopsies to date ..		28.57
7. Positive ring biopsies in total number of cases screened		1.20

Maurice Fremont Smith and Ruth M. Graham, Boston, in an article in the *Journal of the American Medical Association,* Volume 150, Number 6, page 587, state, "Among 704 consecutive new women patients coming to the office of an internist, pelvic cancer was detected by vaginal smear in 10 cases (1.4 per cent). We feel strongly that vaginal smear sampling is not enough. A scrape of the squamocolumnar area of the cervix in addition to the vaginal smear is necessary, as the vaginal smear collects dead cells that have been desquamated from the growth and are lying free in the vagina or at the cervical os for some time. The earliest changes, according to Ayre, in the

malignant or possible pre-malignant state of the cells can best be found thus. This was also pointed out by Professor Hofbauer of Cincinnati in an article in the *American Journal of Obstetrics and Gynecology* as early as 1934."

We quote the above as an example of the type of investigative work that may profitably be done in state hospitals. When we consider that over 50 per cent of the hospital beds in this country are occupied by mental cases, we come to realize what a large pool of patients is available for such or similar investigations. We do not believe that any harm can accrue to the patient's mental condition if these investigations are conducted carefully and with a view to avoiding psychic trauma. Many other forms of examinations, e.g. mass radiography for tuberculosis, laboratory procedures, and courses of anti-syphilitic treatment are done in state hospitals so that it would not seem that special examination involved in cancer screening or other similar observations could do psychic harm. We tell the patients that we are just giving them a "check-up."

I trust that the foregoing remarks and observations outline how the increasing volume of organic disease requiring treatment in state hospitals presents a challenge to the medical, nursing, and laboratory staffs. I consider that this challenge can be met by ever increasing clinical zeal in the application of modern methods to the physical care of the mentally afflicted and incidentally, perhaps, contributing to the advancement of scientific medicine in our mental institutions.

I wish to thank Dr. J. T. Naramore, medical superintendent, for permission to publish this article.

THE WORLD OF BOOKS

Is the most remarkable creation of man.
Nothing else that he builds really lasts;
Monuments fall,
Nations perish,
Civilizations grow old and die out
And after an era of darkness
New races build others.
But in the world of books are volumes
That have seen this happen again and again
And yet live on, still young,
Still as fresh as the day they were written,
Still telling men's hearts
Of the hearts of men centuries dead.

—*Clarence Day*

PRESIDENT'S PAGE

DEAR DOCTOR:

This is your and my Thanksgiving letter. While it states nothing new, it is intended to give some cause for reflection and perhaps some individual re-evaluation.

The philosophy that complete regulation of thought and action by government is necessary has already been imposed upon great segments of the world population. We can be thankful that we are free to live our lives, make our friendships, and practice our profession without political or governmental interference.

Men of medicine have always been leaders in the continued struggle to maintain the dignity of the individual and to perpetuate good and honest government for the people. Dr. Benjamin Rush, Dr. Lymon Hall, and Dr. Carter Broxton were three of the signers of the Declaration of Independence. Dr. Charles Robinson was the first governor of our state, Dr. J. P. Root our first lieutenant governor, and Dr. J. W. Robinson our first secretary of state. These men were leaders in the incorporation of your state Society.

It is my hope that medical men everywhere and particularly those in Kansas will work honestly and diligently to keep our heritage bright.

Yours,

Murray C. Eddy, M.D.

EDITORIAL COMMENT

Is It Art?

During the reign of Joe Louis as heavyweight champion, a sportswriter was criticized for having referred to one of his fights as an exhibition. The columnist replied that the popular concept of this word is a situation where an artist places something upon canvas for the public to look at. Then you begin to wonder, is it art?

Not that the question is vital to a prize fighter, nor even to a painter, and perhaps not at all to a physician, but here too the question recurs. Is medicine an art or is it business and, if a combination of both, can a definition separate the two?

Perhaps not. Perhaps the subject should not be explored at all because the answer is something less than we hope to hear. And yet, among the ashes of misinformation and among the rubble left by those to whom no intangible has meaning, may yet be found a sparkling fragment that is worth looking at.

Even the basest among materialists will recognize that a single act may be performed more perfectly by one man than by another. The sheer selfish joy of having performed to the limit of one's ability brings pleasure, and if that expression of his best whether as a bricklayer or a sculptor is not art, then it is something else synonymous with art.

In days gone by when the helpless doctor sat in that strangely silent family circle holding the dying patient's hand, then medicine was an art. Today he confidently prescribes a drug and leaves. And that is business?

The artist is a perfectionist. He always strives for and never quite achieves the masterpiece. One success merely spurs his desire for improvement whether he is a prize fighter or a physician. He is an artist if he has an ideal that is greater than can be reached. He is an artist if he loves his work and in each effort senses the satisfaction of a new creation. He is an artist who would not change his field regardless of fame or power or wealth. He is an artist who believes that what he does is true.

There can never be a question about this in the artist's mind. The physician has an answer on whether medicine is an art, but when he comes in contact with the unskilled person misunderstandings arise. It is at the exhibition that the work is criticized and condemned. So art is an individual and a personal accomplishment. Call it what you will, after this touches the public, the consumer, something happens. He cannot come in contact with an art and leave it as it was.

To the consumer it is business. He gives his time to view an exhibition. He purchases a ticket to a prize fight, he employs a physician, and the art is now related to his own particular sense of values. It becomes his property in goods or service, and he places his own evaluation upon it.

So actually medicine is both, art to the physician and business to the consumer. This gulf can never be completely erased, and a certain degree of conflict must always be present just as it has been for all forms of artists through the ages, who offered the objects of their skill for public use.

Federal Aid in Kansas

PART II

Among the 35 different federal grant-in-aid programs operating in Kansas, six are in the field of agriculture, although one of these could be considered also under another heading. The story of these grants is here published for informational purposes, and no attempt is made to evaluate the services performed. Some additional information on the subjects discussed in this column is available and may be obtained by writing the JOURNAL.

Agricultural Extension Services funds are administered in Kansas through Kansas State College at Manhattan. On a federal level this project has been operative in the Department of Agriculture since 1914. Money is available "to aid in diffusing among the people of the United States useful and practical information on subjects relating to agriculture and home economics, and to encourage the application of the same."

A total federal grant of almost 32 million dollars was available in 1953, allotted to the different states about as follows: 4 per cent was given on the basis of need, and the remainder was divided on two formulas, one on the basis of rural population and the other on farm population.

Kansas has used federal aid in this field since the legislature passed a resolution for its acceptance on March 1, 1915. Expenditures for agricultural extension work have increased rather regularly to the extent that there has been an increase of one million dollars within the last four years, mostly from local sources.

In 1953 the federal government gave $665,340, the state contributed $407,851, and the different counties appropriated $1,455,863, making a total of $2,529,054. Considering only the federal portion of this grant, Kansas received 2.27 per cent of the total spent in all states.

Agricultural Experiment Stations represent the second federal aid program in this category. This be-

gan in 1887 and has continued to the present time. Even though only a small portion of this grant requires matching, Kansas still gives more than twice the federal amount. In 1953 this was $237,127 from the United States and $583,604 from Kansas, making a total of $820,731. Nothing is shown as coming from county governments. Again, for its possible interest, Kansas received 1.99 per cent of the total federal grant or something under the average for all states.

Cooperative Farm Forestry, the third program, is a small activity in which Kansas paid $3,651 and the federal government granted $1,620 in 1953 for a total of $5,271. This too is administered through Kansas State College and serves to assist farmers in establishing windbreaks, shelter belts, etc. It has been operative in Kansas since 1935. The federal grant is more than 10 million dollars, so Kansas receives only 0.01 per cent of the total, a negligible sum when compared to participation elsewhere.

The fourth, also administered by Kansas State College, is for Agriculture and Mechanic Arts. This has been received in Kansas since 1891 and last year amounted to $88,586, all from federal sources. The total United States program cost in excess of five million dollars, so the Kansas share was 1.76 per cent. This is an outright grant with no matched funds to pay salaries for administrative officials and faculty in the schools of agriculture and mechanics.

The Kansas State Board of Agriculture administers one program for which federal aid is received. This is listed under the title of Research and Marketing and is described as a study of "ways and means of improving storage and transportation facilities, developing new uses for farm products, and expanding marketing outlets." The program has operated since 1948.

Federal grants must be matched dollar for dollar. In 1953 the federal sum was $27,099.59 and the state sum exactly the same to make a total of $54,199.18. Kansas receives 2.3 per cent of the federal appropriation.

The final project is Distribution of Surplus and Other Food Commodities, which operates under the Kansas State Board of Social Welfare. In 1933 Kansas received its first emergency benefit, and in 1935 the project began on a permanent basis. The operation of this program affects several agencies, charitable hospitals, schools, and others, but it was listed under agriculture because its principal purpose is "to prevent the waste of food commodities and to support the price of certain agricultural products."

The program appears to be growing in cost with federal participation assuming almost all the expense. In 1947 the federal government gave $227,222, last year $1,063,385. Kansas contributed $23,817, making the project come to $1,087,202. There is no county charge except for freight, storage, and preparation of foods which have not been listed. The primary federal regulation is that these foods will be properly disbursed and "used in addition to, and not in substitution for, commodities normally purchased." The total United States expenditure was $60,140,000, of which Kansas received 0.96 per cent.

A summary of these six programs under agriculture is as follows: counties spent $1,380,620, the state $936,925, totalling $2,317,545. In addition, federal grants received in Kansas came to $1,660,486 out of a total expenditure of $120,270,000, or 1.38 per cent of these federal appropriations were spent in this state.

Next month an analysis of federal aid to education will be made.

Annual Meeting in Hutchinson

Those who regularly attend annual sessions of The Kansas Medical Society are aware of the many opportunities afforded at the meeting. The next meeting will be held at Hutchinson, May 1-5, 1955, and promises to be one of the finest.

Adequate housing facilities are available in hotels and motels. Those desiring to choose a particular place to stay might write the Chamber of Commerce, Hutchinson, at an early date.

The program committee has completed arrangements for the scientific session. Eleven outstanding speakers from various sections of the country have consented to present papers for a well-rounded program. Like last year, the guest speakers will comprise a panel for afternoon sessions in which all physicians are cordially invited to participate.

Commercial and scientific exhibits as well as the scientific program will be presented at the new arena in Hutchinson where adequate parking space and lunch facilities are available. Buses running between the downtown district and the arena will be available for those without transportation.

Various committees arranging the meeting have already spent many hours preparing this outstanding event. The Committee on Scientific Exhibits is making a special effort to have a wide variety of displays. Space is no problem in the large arena, and a record number of exhibits is the committee's goal. Members of the Society are welcome to prepare exhibits for presentation at the meeting. Recognition will be given outstanding contributions.

The House of Delegates will meet at the usual times. Golf and skeet events will be held on Monday, as in the past. The beautiful ballroom in the Baker Hotel will be the scene of the annual banquet customarily held on Wednesday evening.

Members of The Kansas Medical Society will hear

more of these and other events of the meeting in future issues of the JOURNAL and in correspondence from the Executive Office. This early report is presented to remind the membership of the dates, to encourage attendance, and to assure a fine meeting next May.

THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

Although the elections back home are more stimulating than Washington doings these fall weeks, some of the quiet planning going on at the Pentagon should be of more than passing interest to physicians, young and old. The objectives are familiar: first, to insure a steady supply of physicians for the services; second, to improve the medical care program for military dependents. Primarily responsible for working things out are Dr. Frank Berry, Assistant Secretary of Defense for medical affairs, and the officers assisting him.

To insure that the services will get the physicians they need after the scheduled expiration of the Doctor Draft Act next July 1—without disrupting residency training—a plan bearing the formidable name of the Armed Forces Reserve Medical Officer Commissioning and Residency Consideration Program has been put into effect. It applies only to interns who have had no prior military service and who therefore have a two-year obligation for service under the regular draft.

The plan's first deadline was October 10. By that time these young physicians were to have sent in to the Defense Department a form with the following information: Their first, second, and third choices among the services, whether they wanted additional deferment for residencies and if so choice of hospitals, and the preferred specialties. Any in this group who do not apply for reserve commissions will be subject to the regular draft, will not be considered for residency deferments, and will not have a choice of services.

There is another problem involved. It is estimated that about half of the interns will want residency deferments. However, not more than a quarter can be deferred if the Army, Navy, and Air Force are to get their quotas of physicians. This is being resolved by a lottery. Those winning deferments will stay in the reserves and be called up for duty as their specialties are needed after the completion of their residencies. Those losing out will be called as needed at the end of their internships. The 50 per cent not asking for deferments will be allowed a choice of the month to be called up, a privilege not accorded the others.

On the dependent medical care program, Dr. Berry's annual report discloses that the department is all set to put the expanded plan into operation, should Congress enact it. An implementing directive has been drawn up, a tentative fee scheduled modeled on the VA "Guide for Medical Services" has been prepared, and a uniform "Military Dependent Identification Card" has been developed and placed in limited use by the Navy and Air Force.

A dependent care bill was introduced last session but not pressed by the Defense Department. It provides a uniform program for the three services, with dependents defined and the extent of care limited. It also would have the military medical departments take care of all the dependents they could handle, with only the remainder going to private physicians and hospitals. The American Medical Association believes this should be reversed, with emphasis on private, non-government care for dependents.

The Defense Department is interested in other devices to keep up the quality as well as the number of its physicians. One of these is a scholarship program, which would require one year of military service for each scholarship year. Because regular draft time could be served out this way, any scholarship contract would call for a minimum of three years' active duty. The department has high hopes that this program will be authorized by the next Congress. It also is hopeful that, once in operation, the scholarship contracts would result in more young physicians joining the regular Army.

Meanwhile the Hoover Commission on Organization of the Executive Branch and the Kestnbaum Commission on Intergovernmental Relations continue with their studies and report-writing, efforts that now are definitely unspectacular but that ultimately could mean important changes in the government's medical programs.

The Hoover Medical Task Force is nearing the end of its long review of all federal medical operations. Its recommendations will be submitted to the full commission for consideration in the commission's report to the President, due at the White House next May.

The Kestnbaum commission's work of greatest medical interest is the study of health grants-in-aid, on which a special committee has just completed its report. The full commission is scheduled to report back to Congress by next March.

Clinicopathological Conference

Case Presentation

Dr. William E. Larsen, resident in medicine: This 66-year-old Negro was admitted to KUMC on August 10, 1953, and died August 22, 1953.

The chief complaints were cough, shortness of breath, and weakness.

The patient was in good health until August, 1952, at which time he experienced a sudden onset of dizziness and transient blindness accompanied by numbness and weakness of the left arm and left leg of ten days' duration. In December, 1952, he had an episode of numbness and weakness of the right arm and right leg. He also found that although he could see he was unable to read, and he noted some impairment of his memory. Following the episode in December, 1952, the patient quit his work as a saloonkeeper. Strength gradually returned to his right arm and both lower extremities. The left arm weakness persisted.

Three months prior to admission the patient noticed the onset of a nonproductive cough, first with effort and then at rest while lying in bed at night. With the nocturnal coughing he became dyspneic. He would sit up in bed until the cough was relieved. The cough became productive of a whitish mucoid sputum. These symptoms gradually progressed until his KUMC admission in August, 1953.

Past history revealed that he had the usual childhood diseases plus typhoid fever and malaria. He passed a large tapeworm when he was a child. He had gonorrhea at 18 years of age with five subsequent episodes. He also stated that he had a prolonged diarrhea and abdominal pain beginning about six years prior to admission and lasting for about four years. This was accompanied by red blood and black tarry stools on several occasions.

Significant family history revealed that one brother and one sister died with pulmonary tuberculosis. His stepson died of tuberculosis in February, 1953.

The system review was significant in that he had a nonproductive cough of about three months' duration and he had nocturia once nightly of several years duration. Weight loss of 20 pounds occurred during the year prior to admission.

On physical examination, the well developed, poorly nourished Negro male of 66 years of age appeared to be in respiratory distress while lying in bed with head elevated. Conjunctivae were pale. The pupils were of average size and regular. They reacted sluggishly to light. The optic disc margins were distinct. There was an old scar in the left fundus but no hemorrhages were seen. The retinal arterioles were narrowed. The mouth was edentulous, and there was a diminished gag reflex. There was no lymphadenopathy in the neck or supraclavicular region.

The trachea was slightly deviated to the right. Rales of a fine moist nature were heard scattered in the left anterior infraclavicular region and across both posterior lung fields at the bases. The heart was of normal size with good quality tones. No murmurs were heard.

The abdomen was soft, and no masses or organs were palpated. The prostate was of normal size and consistency. There were no abnormalities of bones or joints.

Deep tendon reflexes were increased on the right. The left arm was ataxic. Bilateral ankle clonus was elicited. Vibratory sensation was absent in both lower extremities. The pulse rate was regular at 80 per minute. Brachial blood pressure was 110 systolic, 65 diastolic.

On laboratory examination, the urine specific gravity was 1.020 with two plus albumin. The urine contained 3 to 5 pus cells per high power field with some waxy, hyaline and granular casts. Red blood count was 4.7 million with 14 grams of hemoglobin. White blood count was 19,550 with 82 per cent polys, 11 per cent lymphocytes, 5 per cent monocytes, 1 per cent eosinophiles, and 1 per cent basophiles. VDRL was negative. The blood non-protein nitrogen was 57 mgm. per 100 ml., creatinine 2.1 mgm., sugar was 98 mgm., and the serum sodium was 136 mEq./L. The total protein was 7.1 grams per 100 ml. with 5 grams of albumin and 2.1 grams of globulin. The total serum bilirubin was 1.0 mgm. per 100 ml. The sedimentation rate was 5 mm. in one hour. Electrocardiogram and x-rays will be demonstrated.

A few hours after admission to the hospital and while being bathed in the bath tub, the patient became dyspneic and cyanotic. He was returned to his bed where examination revealed no change from the above listed findings. With oxygen by mask he became comfortable. The circulation time arm-to-tongue was 17 seconds, arm-to-lung was 11 seconds, and the venous pressure was 84 mm. saline. It was noted that he coughed frequently in paroxysms producing a whitish mucoid sputum. Several specimens of this sputum were sent to the laboratory for study. He complained of some right anterior chest pain which was controlled by aspirin and codeine.

While eating his lunch on the fifth hospital day, the patient aspirated a small amount of food fol-

From the University of Kansas Medical Center. Edited by Glen R. Shepherd, M.D., and Mahlon Delp, M.D., from recordings of the conference participated in by the departments of medicine, radiology, pathology and oncology and the third and fourth year medical students.

lowed by severe paroxysms of coughing for 20 minutes. Oxygen was necessary to relieve dyspnea and cyanosis. He was given procaine penicillin, 600,000 units daily. The white blood count on August 11 was 26,150 with no change in the differential. On August 14 it was 35,000, and by August 17 the white blood count was 54,000 with a differential of 88 per cent polys of which 76 were filamented and 12 were nonfilamented, 8 per cent lymphocytes, 1 per cent eosinophiles, 2 per cent monocytes, and 1 per cent metamyelocytes. Lung field examination revealed no changes in breath sounds.

By August 20 edema was noted on the upper right leg and bilaterally on the lower legs. Presacral edema was noted by August 22. He received a 0.6 mgm. dose of digitoxin IV at 12:00 noon. Three hours later the patient's dyspnea became worse and there was moderate cyanosis, although only a few rales were present over the posterior lung fields. The dyspnea remained the same and the pulse was strong at 100 per minute. At 4:05 p.m. the patient slumped over in bed and was pronounced dead.

Dr. Mahlon Delp, chairman: Any questions of Dr. Larsen?

Q: What were the results of skin tests?

Dr. Larsen: Positive tuberculin and positive histoplasmin; negative blastomycin and negative culture of urine.

Q: Did the patient have calf tenderness?

Dr. Larsen: This patient had no tenderness at any time during his hospitalization.

Q: What was the appearance of the sputum?

Dr. Larsen: The gross appearance was white and mucoid with a volume of about 30 to 60 cc. daily.

Q: Did he have difficulty raising that or did it come up easily?

Dr. Larsen: It came up easily.

Q: Was it gelatinous, opaque or clear?

Dr. Larsen: It was clear and watery.

Q: Was it sticky?

Dr. Larsen: Yes, it was sticky.

Q: Did an oil form on it? Was it allowed to collect for 12 to 24 hours?

Dr. Larsen: It did not layer.

Q: What was the temperature range?

Dr. Larsen: The patient was afebrile during his hospital course.

Q: Did this man smoke?

Dr. Larsen: I don't know.

Q: Had this man had any occupation other than that of saloon keeper?

Dr. Larsen: No, at least not within the 15 years preceding hospitalization.

Q: Did the patient give a history of ever having been treated for syphilis?

Dr. Larsen: No.

Q: Was there any examination for blood in the stools?

Dr. Larsen: No, that was not done.

Dr. Delp: Did you notice any blood in the stools?

Dr. Larsen: The stools were not tarry during hospitalization.

Q: What about the intensity of the breath sounds? Was there any instance of alteration in respiration?

Dr. Larsen: The breath sounds were fair to good over his entire chest. There were no signs of any obstruction.

Q: In spite of dyspnea and cyanosis?

Dr. Larsen: In spite of dyspnea and cyanosis.

Dr. Delp: Mr. Becker, let's see that electrocardiogram.

Mr. Donald E. Becker, fourth year student:* The rate is 110. There is regular sinus rhythm as evidenced by T waves in leads I, II, aVr.

The axis deviation is to the left about 5 to 10 degrees. All the T waves in these leads are upright. There is ST segment elevation in leads V_1, V_2, V_3 and aVf, but the elevation is only one millimeter, which is normal.

My interpretation is sinus tachycardia.

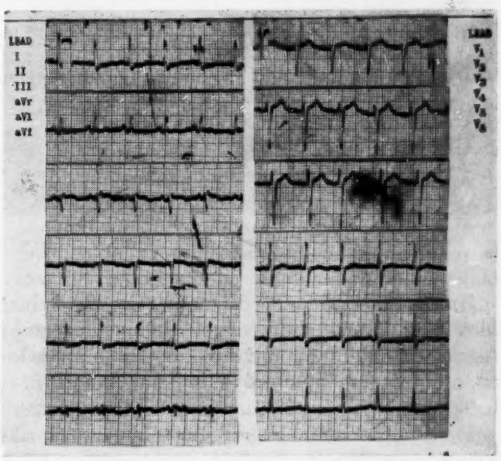


Figure 1. Electrocardiogram showing sinus tachycardia.

Dr. Delp: Do you have any comments, Dr. Lin?

Dr. T. K. Lin, medicine: It showed only tachycardia.

Dr. Delp: Mr. Wilcox, let's see the x-rays.

Mr. Robert N. Wilcox, fourth year student:* We have three chest films and one intravenous pyelogram, a skull film, a K. U. B. film and a gastrointestinal film showing the stomach and small bowel.

The first chest film was taken on July 16, the second

* Received M.D. degree in June, 1954.

on August 11, the third on August 15. About the only thing you can say about these films is that there is an extensive patchy infiltration in the lower lobes of both lungs. The apices are relatively clear. There are no hilar nodes seen. The heart is normal in size. The trachea is in the midline.

In the next film we see this diffuse patchy infiltration in the lower lobes of both lungs and again in the third film. The apices remain comparatively clear. The costophrenic angles are clear.

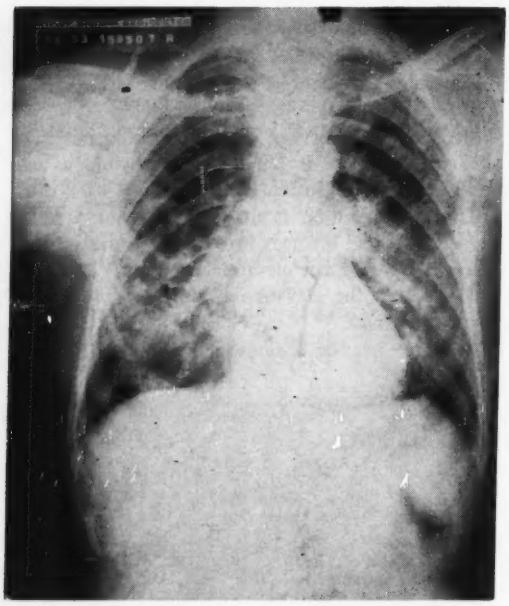


Figure 2. X-ray of chest showing extensive patchy infiltration in the parenchyma of the lower lobes.

I think our differential diagnosis from these chest films must include chronic passive congestion, pneumonia, with which this picture is compatible, sarcoidosis, and lymphatic spread of a malignancy.

We would have to consider a chronic passive congestion, but I think the normal size of the heart would rule that out. We were considering sarcoidosis but I think we would expect to see, though we would not necessarily have to see, an increase in hilar nodes. It was not noticed in these films. The last thing we must consider is a lymphatic spread of malignancy. We can't rule this out from these films. We certainly do not see malignancy in the films of the gastrointestinal tract. In the pictures of the stomach we see the normal rugal folds; the duodenal bulb has filled well. There are no abnormalities of the large or small intestine. I would consider this a normal film.

The skull film is normal. There may be some narrowing between C 5 and 6. There are no evidences of bone destruction.

The intravenous pyelogram was taken 45 minutes after injection of the dye. We can see here that the markings of the left kidney are absent. On the right side they are normal. I would consider this to be a non-functioning left kidney. Perhaps here we can see the prostatic shadow. There is no evidence of any bone destruction.

Dr. Delp: Dr. Hogan or Dr. Litton, have you any additional comments?

Dr. L. O. Litton,* radiology resident: I think Mr. Wilcox did very well.

Dr. Delp: First of all, this patient did have neurological signs and symptoms extending over a period of time. We should have some explanation for that.

Next, there is the family history of undoubted contact with pulmonary tuberculosis. That must have a bearing upon the discussion and require some comment. The patient did have dyspnea. Was the dyspnea cardiac in origin or was it perhaps cardiopulmonary —a combination of the two? I think we must discuss this.

Finally, of course we wonder why this man died in such difficult circumstances so soon after coming into the hospital. It is necessary to explain why he worsened so rapidly.

Mr. Coble, may we have your differential diagnosis?

DIFFERENTIAL DIAGNOSIS

Mr. Rollo J. Coble, fourth year student:† In this patient's previous illnesses are descriptions of two neurological deficit episodes. I think that the history of the sudden onset with improvement, the relatively short course of those episodes, and the fact that he had not had continuing increase in his symptoms are rather good indications that they were cerebrovascular accidents, probably hemorrhagic in nature. I don't feel that they have any bearing on this present illness.

The history of a four-year course of diarrhea with occasional bleeding I find very difficult to explain. He had been asymptomatic in that respect for three years. And again, I don't think that had any bearing on the present illness. I think that the man probably had a bleeding ulcer at that time. The possibility of a gastrointestinal malignancy is pretty well ruled out unless he had surgical intervention, which has not been mentioned, as three years without symptoms pretty well separates it from the present illness.

The patient had cough, dyspnea, and weakness. There are several things that don't fit too precisely

* Completed residency in September, 1954. Now at Springfield, Missouri.
† Received M.D. degree in June, 1954.

but which, I think, should be mentioned. Among these are bronchiectasis. The patient did have a productive cough of three months' duration. I think that three months is a short time for bronchiectasis to become this severe. He had no hemoptysis. Other than during his hospital stay, we don't know how productive was this cough.

The patient apparently had close contact with tuberculosis. The weight loss, cough, and weakness are all good evidence that the man had an active pulmonary tuberculosis lesion. I see no evidence of it in the x-ray. That is, I see no evidence of a single lesion. I think that the man may have had a diffuse pulmonary tuberculosis.

Left heart failure is a possibility. There was no evidence of primary heart disease to produce such decompensation. He had a normal arm-to-tongue circulation time, which pretty well eliminates the probability of a left heart failure. The patient had neither physical nor historical evidence of a primary focus for a pulmonary infarction. The history fairly well rules it out. Although showing rapid progression, the last three months' course did not have the sudden onset you would expect to find in pulmonary infarction.

Mediastinal tumor could produce such a picture. The x-ray, as nearly as I can see, shows no mediastinal tumor. However, it is possible that he had one which was masked by the heart and other mediastinal structures. We have only an anterior-posterior view. The progression is rather rapid for most mediastinal tumors.

The x-ray picture is consistent with that of metastatic carcinoma—metastatic malignancy—but again we find no evidence of a primary lesion. The course is consistent with this, but I feel that the x-ray picture is not too consistent in that the lesions are not circumscribed.

Primary carcinoma of the lung could account for the patient's history, symptoms, and weight loss. But there is no appearance of a discrete lesion in the lung, which is the typical picture of primary carcinoma. I know of no carcinoma that I have seen or heard discussed that has started with such a diffuse picture. Again, having only AP views, it is possible that a primary carcinoma of the lung is not visible. But I don't feel that it would produce the x-ray picture we have. I think that if it were a primary carcinoma of the lung producing the symptoms of pneumonia, with the high white count, the changes in the lung would be more localized and more circumscribed. The patient is a male and in the right age group, which weights our thinking in favor of primary carcinoma of the lungs. Rapidity of progression does so, too.

However, the patient's history of tuberculosis, his rapid course, and the elevated white count, I believe, are sufficiently strong evidence of my final diagnosis of tuberculosis with a superimposed bacterial infection of unknown type.

Dr. Delp: Mr. Sandidge, do you think the fact that the findings were plucked out of the protocol may have influenced Mr. Coble in his final diagnosis?

Mr. Lewis Sandidge:* I'll say this much—after seeing the x-ray I changed my opinion—I think he probably changed his also.

Dr. Delp: What is your best diagnosis now?

Mr. Sandidge: My best diagnosis now is tuberculosis. Coble mentioned that there is no type of carcinoma that would fit that picture. I'm not sure, but I think that there is a carcinomatosis—a pulmonary carcinomatosis—that would produce a picture like this.

Dr. Martin FitzPatrick, assistant professor of medicine: The essential feature to consider in this patient is that we have a 66-year-old Negro male who had been in relatively good health all his life and in the last four months had been struck down with a severe pulmonary ailment that finally killed him. I think there are a few points that should be brought out carefully in his history.

One, of course, is the obvious one, that he had lived in a tuberculous environment. You will want to know if he lived in the same room, the same house, with the patients while they were having active pulmonary tuberculosis. The mere historical documentation that members of the family had the disease really does not mean that the patient was in intimate contact. This is a good suspicion, but I think you must go farther.

The other thing that I am uneasy about is a documentation of his work habits other than tending bar. From the time he left his family unit to go out into the world to work until he came back into the hospital, did he at any time work or be around any conditions that are the common cause of pneumoconiosis, such as silicon, asbestos or beryllium, bauxite, or diatomaceous earth? Any or all of these things can show a terminal picture like that presented today. The only way you can rule them out is by an adequate history.

Again, you want to know, in an elderly individual with progressive and fulminating disease, what his habits were in regard to the use of oil. Did he use oil nose drops? Did he use nose drops purchased at a drugstore over the counter without a prescription? Most of those are in an oily base. How often did he use them? Did he use oil to spray his throat for lubrication purposes? That is what happens with some singers. Did he use oil for catharsis? This was an

* Received M.D. degree in June, 1954.

individual who has absent dentition. He is described as having a poor gag reflex, and he aspirated before he arrived in the hospital.

I think you must be on your toes as to the possibility of whether he aspirated before he came in—specifically, whether he aspirated oily or fatty products.

I will briefly run through some of the disorders that could produce the terminal picture we see on the x-ray. I will consider for a moment some of the inflammatory ones. First of all, bronchiectasis. If this was bronchiectasis, I think it must have been diffuse. It is true that most of the infiltrations we see on the x-ray were in the lower half, but if you look at the films closely, you see a fine reticular pattern in the upper lung fields as well. Of course, it has been mentioned previously that the history in regard to sputum production, reputed pulmonary infections, possibly hemoptysis, going back to childhood, is lacking in this individual. I don't think we shall belabor that point further.

Now we come to tuberculosis, which after all is the mother of all chest diseases. I think there is the possibility of tuberculosis, judging from the history. He could have had phthisis: cavitary pulmonary disease with a rapid bronchogenic dissemination leading to multiple areas of tuberculous involvement in all his lungs. I think you would anticipate seeing a cavity on the casual x-ray. The sputum should have had pus in it. He should have been febrile. He should have been a lot sicker and toxemic and infected than this patient was when he was first seen at this hospital. So, in spite of his family history, on the limited information we have, I am ruling out tuberculosis. With adequate cultural studies we could always rule it out. For the purpose of argument, let's do that.

I think another thing we must consider are the suppurative pneumonias. A diffuse suppurative process that is generally superimposed on a chronic bronchitis or on a chronic bronchiectasis can lead to a terminal film picture similar to this. Now that again has a prolonged period of chronic pulmonary symptoms, of cough, of raising pus and purulent sputum, of repeated low grade infections, and of visits to the hospital. None of those were present in this patient. So I would be inclined to rule out chronic suppurative pneumonia in both his lungs. The same thing would hold true regarding acute pneumonia due to the common bacterial offenders.

Pneumoconiosis—I have belabored that point enough. I do not like to turn my back on that as a diagnosis from an x-ray in an individual without an adequate history. But let us assume for the purpose of argument that he had not had any known exposure to any of those agents.

Some of the fungus diseases could do this. I think it is well to remember that occasionally disseminated coccidioidomycosis, histoplasmosis, blastomycosis, or actinomycosis can mimic this in the x-ray picture to some extent. Such people are sicker. They present a more toxic state than was seen in this patient. Again, you can only rule them out with adequate cultural bacteriological studies.

The diseases of unknown etiology should be mentioned. I have seen a similar picture in scleroderma. It is not as fulminant as this but is rather a diffuse pulmonary fibrosis. It causes marked disturbance in alveolar respiratory gas exchange and little damage to ventilation. Such individuals have a profound respiratory deficit; they also show the classic skin findings of scleroderma as well as esophageal findings. We are told that the esophagus was normal in this patient, and so I think we can eliminate scleroderma as a cause of his alveolar difficulties.

Sarcoidosis, I think, would be unusual in this individual. He had no peripheral lymphadenopathy. He had no enlargement of bronchopulmonary or mediastinal nodes. His globulin was normal. He had no other systemic involvement, such as involvement of skin, salivary gland, or uveal system. That, I think, eliminates sarcoid.

That brings me back to lipoid pneumonia. I feel that we are missing this disease in many elderly people because we are not looking for it. We know that in two age groups, the very young and the very old, patients will aspirate oil and fat products and have a chemical pneumonitis set up in their lungs leading to severe fibrosis, incapacity, and sometimes death. Without that information, I would tend to rule out lipoid pneumonia. The few individuals I have seen with it have been sicker than this patient was. They have been febrile and have had pleural involvement. So let's eliminate lipoid pneumonia.

Another thing I think should be considered is aspiration pneumonia. We realize that practically all pneumonias are aspirational, but I refer specifically to the picture seen in elderly individuals with absent teeth and a poor gag reflex. The great watchdog of the tracheobronchial tree is eliminated, and these folks will unconsciously aspirate from time to time enough stuff within the tracheobronchial tree to leave a pulmonary fibrosis. The lesions of the esophagus are notorious for this. Over a period of years, the smooth or benign tumor, the leiomyosarcoma, can produce a severe form of pulmonary fibrosis simply from the repeated unconscious aspirations of the patient at night when he is asleep and his cough reflexes are minimized. In some of these folks the presenting picture can be that of pulmonary disease. With the normal esophagogram in this individual, I think we can rule that out.

The question of multiple pulmonary emboli, either

of blood elements or of tumor, is worth considering. In this individual there was no suggestion from either history or physical examination of an obvious focus supplying emboli to the internal blood vessels to his lung. The people I have seen with such a disorder have been a lot sicker, most of them febrile. Most of them occasionally have shown hemoptysis, severe chest pain, and a few other things lacking in this patient's picture.

Carcinoma must be considered. Some mention has been made of the fact that this would be an unusual site for a primary bronchogenic carcinoma.

Usually primary bronchogenic carcinoma shows symptoms of cough or bronchial obstruction. Metastases from carcinoma arising in another organ and brought to the lung, I think, can be ruled out because of the fact that it was not brought out in the history. There was no suggestion of it in the history or on the physical examination. The fact that this man had a normal gastrointestinal profile on barium studies would rule out lymphatic dissemination of carcinoma.

We're getting very far out on a limb. There isn't much left. One thing I think we can say about this patient—I think it's the same point that Dr. Herbert was getting at earlier—is the striking history, and this is what you must build your whole house on. If it's true, you've got a fine house. If it's not, it comes crashing down like one made of a deck of cards. But if you can be sure that, up until four months before this patient came in and died, he was relatively symptom-free as far as his lungs are concerned, then there aren't too many things that can do that.

First, I think, in this patient we must seriously consider what has been previously described as pulmonary adenomatosis: a diffuse multicentric tumor arising in practically all portions of the lungs. We don't know too much about this disease. It is thought to be similar to the infection jazziekte in sheep. It is thought by others to be possibly viral in origin. At any rate, these folks show a clinically profound dysfunction in their physiology, particularly in regard to respiratory gas exchange, without much defect obvious in their ventilatory function until later.

In the few cases I have seen, the sputum is extremely characteristic, with copious quantities of sputum that is white, viscid, and opaque, much like the lining on opal glass light fixtures. It has a high protein content, and when you take the glass jar and invert it you can put it back down without fear of spilling—it is that thick. Lacking that in this individual, and being told that his sputum is nondescript, nonspecific, the mucoid sputum that anyone raises, I must turn away from pulmonary adenomatosis.

That brings me to my last entity which I believe this fellow had, a rare disorder. I want to stress that point because when you are working in a hospital where there are a large number of pulmonary problems, you probably won't see more than one or two of these in several years. It is the picture I think this individual had, described by Hammond and Rich in 1944, which they called "acute diffuse interstitial fibrosis of the lung." It's a syndrome that they described as an acute form of pulmonary disease appearing in people who previously had been well. They are struck down without any warning, usually with a non-productive cough, later on raising sputum, with a severe derangement of their pulmonary physiology. They become hypoxic, cyanotic, and weak, and they lose weight. Many such patients earlier were afebrile and later on died of either a terminal bronchial pneumonia or from an acute cor pulmonale. I feel that fits this individual best.

I would reconstruct it by saying that here was a 66-year-old man with diffuse vascular disease. I think he probably had cerebral atherosclerosis. I would explain his previous symptoms on the basis of cerebral thrombi leaving some residuum. Superimposed on that framework, I think this individual acquired the disease described, acute diffuse interstitial fibrosis, and rapidly succumbed to that. I think terminally he was helped out by bronchopneumonia (the old man's friend), and also by congestive failure.

We are told that when this man came into the hospital he was afebrile and he was not in failure. Yet before he died he developed a picture of congestion. I think there is strong possibility that he might have developed acute cor pulmonale. And there is a possibility that he might have had myocardial debilitation and failure on a hypoxic basis.

Dr. Delp: Our guest is Dr. Stewart from the National Cancer Institute. Dr. Stewart has a keen interest in one specific area of this problem. (I must apologize to the senior for not letting him know that Dr. Stewart would participate. I was afraid that I might influence him.) Dr. Stewart?

PATHOLOGY REPORT

Dr. Harold L. Stewart, visiting pathologist:* It is pretty obvious that I'm not here to discuss pulmonary pneumoconiosis or anything like that.

This patient died of adenocarcinoma of the lung.

During the clinical course of the patient, Dr. Pollack examined the sputum for carcinoma cells, and she made a positive diagnosis of adenocarcinoma in this case.

The specimen which we will see has nodules throughout all lobes of the lung. These nodules are

* Chief, Laboratory of Pathology, National Cancer Institute, Bethesda, Maryland.

hard and circumscribed and there are many of them—they vary from 1 to 2½ cm. in diameter, most of them. Some of them have a peculiar hollowed-out central cavitation, and the inner aspect of that cavity is smooth as though it were lined by alveoli. There is in the gross note of the autopsy protocol the information that when these lesions were squeezed they exuded a mucoid material.

Figure 3. Gross photograph of cut section of lung, right lower lobe, containing several tumor nodules. Note the pattern of central cavitation with surrounding radiation of tumor.

Now there was no real primary tumor in this case, in the sense that most lung cancer arises in a bronchus, is often visible in the x-ray, and then there is secondary spread throughout the lung from that particular area. As you can see from the x-ray and, as a matter of fact, from this specimen, there was no good primary of that type where it could be demonstrated in the bronchus with the characteristics of a primary cancer of the lung.

However, in the upper portion of the lower lobe on the left side, there was the largest mass of tumor that was seen in this patient—an area about 1½ x 2 inches—but even that was not one continuous nodule. It consisted of a fairly large nodule and four or so smaller nodules. There was a good deal of retraction of surrounding lung tissue. The bronchi have been carefully explored in this specimen, particularly next to this particular nodule. We traced out the bronchi as far as we could, and once they ran into the region of the nodule they seemed to be compressed and the lumens obliterated. This was borne out also in the microscopic sections. In many areas the bronchi actually were compressed. One reason for this, as we can see from the microscopic pictures, is that there was extensive lymphatic invasion in the lung, bronchi, and around the blood vessels. You could see tumor cells within some of the larger bronchi and there were tumor cells within the blood vessels in this lung.

In other words, we are faced here with a problem. Is the tumor primary in this one nodule in the upper lobe of the left lung? Or is this one of those so-called multicentric primary tumors, so-called bronchiolar carcinoma related to pulmonary adenomatosis by some? That's really the problem as the pathologist is faced by it here (and I'd like to say something about it when I show the sections).

There was extensive lymphatic permeation subpleurally. There were a few lymph nodes around the bronchi—and I believe I saw one around the aorta—containing cancer. I think there were two or three in the left cervical region that showed cancer. But as a matter of fact the extent of involvement of the lymph nodes by cancer was relatively minimal. The peripheral sinuses were infiltrated, and there was some extension into the surrounding fat, but there was no large amount of replacement of nodes by cancer tissue. I thought in the left cervical node there was involvement of a blood vessel, but there was a question of whether that might be one of the larger lymphatic vessels. But really the lymph nodes did not show much involvement at all.

Elsewhere in the body, either in the lower thoracic or the upper lumbar vertebra, there was a small solitary metastasis of carcinoma. That was the only tumor that was found outside of the lung and cervical lymph nodes—this one deposit in one of the vertebra. There was, of course, a careful search of other organs that might yield metastases of this type to the lung, the pancreas, the bile duct, the entire gastrointestinal tract, and they showed none.

Another striking feature about the lung in this case was an extensive and widespread thrombosis of the blood vessels. Those thrombi were of varying ages. Some of them were old; some of them were fresh. There were red thrombi and mottled thrombi; there were thrombi in varying degrees of organization and recanalization. So I felt certain that some of these thrombi in the vessels of this lung had been there for a considerable time. We did find a source for emboli in the prostate, but the thrombi in the prostatic veins appeared to be fresh. Certainly the thrombosis of the vessels in this case was extensive, and that process had been going on for some time.

Despite the pulmonary vascular lesions, there was no cor pulmonale in this case. The right ventricle was dilated, but there was no right-sided hypertrophy.

There was some hypertrophy of the heart—I believe the heart weighed 450 grams. The coronary vessels showed moderate arteriosclerosis and some narrowing in the size of the lumen in some cross sections. But there was no evidence of any gross infarction.

In addition the patient showed arteriosclerosis of the aorta and a little arteriosclerotic atrophy of the kidneys. There was a hyperplasia of the prostate, and there were thrombi in the prostatic vessels. I noticed one small infarct in the prostate about one cm. in diameter.

The gastrointestinal tract and the pancreas showed nothing of note.

The liver was interesting. There was some fatty central congestion and infiltration with hepatic cell necrosis. Of course this man was in cardiac failure. Then there were a few small nodules that looked a little like adenomas in the liver, and yet microscopically there were bile ducts and portal areas within these—a curious sort of lesion which may have represented adenomas or perhaps merely regenerating nodules.

In the brain there was severe arteriosclerosis of the vessels. There was an extensive area of old softening of the brain in the right parietal region of the cortex. There was a vessel leading to that which was completely occluded. In the internal capsule on the left side there was an area of degeneration and atrophy—an old scarred area. I presume that the patient's residual paralysis on the right side was due to the lesion in the internal capsule.

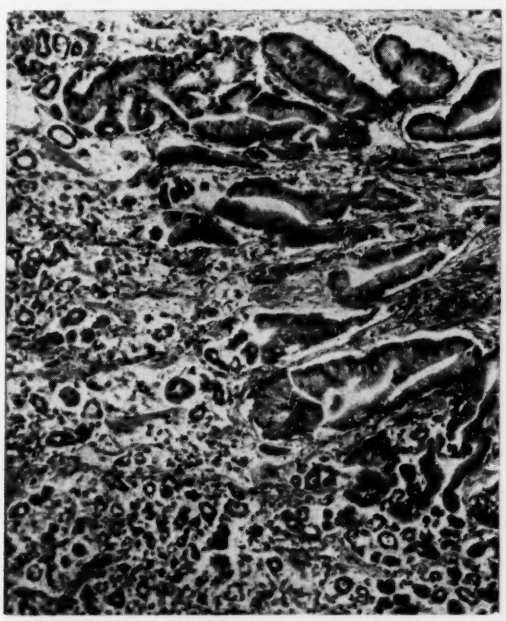


Figure 4. Photomicrograph of section through typical tumor nodule in lung, showing central tubular structure (on the right in photograph) lined by tall columnar epithelium resembling bronchial mucosa with rosettes around the periphery (on the left in photograph).

This gives you the general diagnosis and important lesions.

On microscopic examination of the lung, some localized areas of the tumor were cavitated and others were fibrosed and burned out.

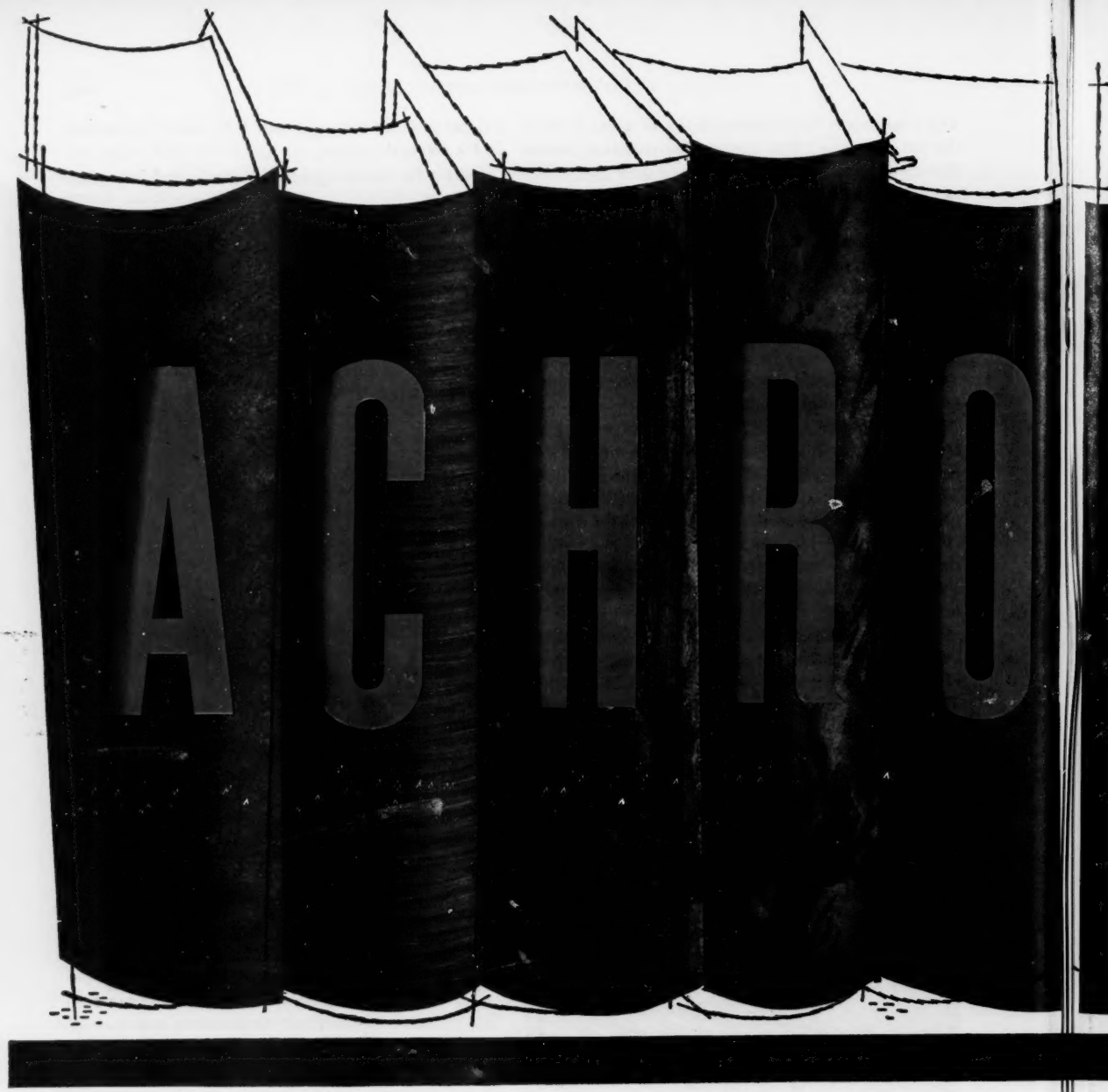
The Periodic Acid Schiff reaction was positive, demonstrating the mucus production in this tumor. Some of the cavities actually contained an enormous amount of mucus. Now whether it was due entirely to production of mucus by the tumor cells or whether in part due to obstruction of the bronchus and accumulation of mucus, I don't know. Perhaps both were operative.

There's a question about the origin of this tumor. As you know, a so-called bronchiolar carcinoma (at least, it's classified as that) is a lesion that's often multiple throughout all lobes of both lungs. It's related on one hand to jazziekte, so-called pulmonary adenomatosis, and on the other hand to primary adenocarcinoma of a main bronchus. The so-called bronchiolar carcinomas have been given separate designation because a rather small per cent, probably 3 or 4 per cent, are believed to be multicentric in origin.

There is a great deal of dispute about that. Fred Stewart, for example, at Memorial Hospital, in analyzing their cases, showed that the postoperative survival of these cases is better than in the localized type of adenocarcinoma, which makes him believe that these are not multicentric but that they are metastases from one area. If they were multicentric, there would be no hope—they would arise all through all lobes of both lungs. And even though you took one lung out or one lobe out, the patient would still develop tumors in other areas.

There was nothing in this lung that I have seen that indicated to me the development of cancer—that is, the pre-cancerous state, a terminal bronchus undergoing a hyperplasia that leads to cancer. I saw lots of cancer in the alveoli; I saw it in the perivascular and peribronchial lymphatics. But there was no place where I saw, at the junction of a terminal bronchus and alveolus, changes that I would interpret as a beginning of cancer. Certainly there is a possibility that this large lesion in the left lung was the primary site, that the spread throughout the lung was by the lymphatics, and that all the rest of this represented secondary deposit.

There is one other possibility, too, and that is dissemination by the air passages. Ordinarily that just does not occur—we know that. For example, in cancer of the larynx, in cancer of the tongue, in most cancer of the lung, we know that dissemination by the air passages simply does not occur. But I must



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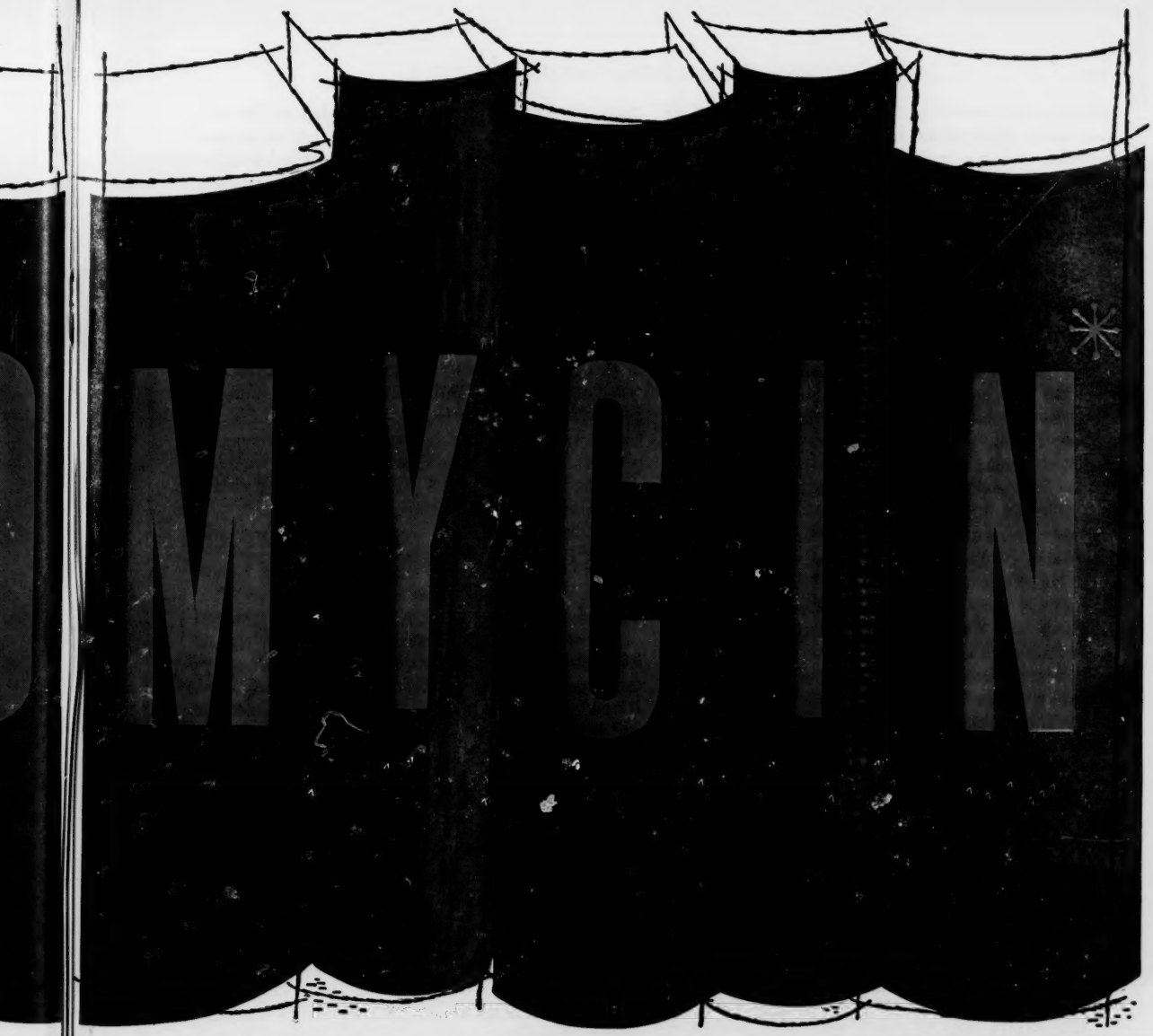

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admit in this case there were suggestions of that in the slides. The cancer cells were lying inside the bronchi, even the major bronchi. You could see a small alveolus and you could see cancer cells in there, often against the wall of the alveolus. This case certainly suggested to me the possibility that the primary focus was in the left upper lobe and all the rest of this represented metastasis via the lymphatics and possibly the air passages.

Dr. Delp: Dr. Firminger, do you have any comments?

Dr. H. I. Firminger, pathology and oncology: I will just register the opposite opinion that this probably was a tumor arising multicentrically. I have two reasons for my opinion. One is that I am loathe to accept air spread of tumors, though I must admit that maybe I am biased by the fact that most of them don't do it. And I cannot explain to my own satisfaction so wide a spread into both lungs of this tumor by lymphatic channels without more involvement of hilar lymph nodes—replacement of hilar nodes. It is conceivable, but somehow it doesn't quite fit.

And finally, a somewhat more subtle thing, each of these individual nodules appeared to me as though it must have arisen there, though I can't show you the bronchus or the terminal bronchiole from which it came. The reason I say that is because of the picture Dr. Stewart so well illustrated of the central cavitation which was evident in these lungs, with degeneration around it and then a radiating pattern of what looked like bronchiolar epithelium which then differentiated into alveolar duct-like epithelium. This two-cell pattern, which was consistent throughout, of central bronchiolar type and then, if I may use the term, alveolar duct type of epithelium beyond it in practically all the nodules seems so consistent and it seems to have arisen in all these places at once.

I would prefer to think of this as a multicentric tumor, but it is clearly a moot point.

The picture does fit pretty well with pulmonary adenomatosis, except for the widely disseminated lymphatic spread. It is not particularly pointed out in the literature, but in my own experience one does not usually find this picture at autopsy without at least metastasis by the lymphatics to the hilar lymph nodes, which was present here.

Dr. Stewart: There are a couple of things to be mentioned about this. One is that there really was an abrupt history in this case. This man came in and died, and as far as we know he was in pretty good shape before that. If you think of multicentric carcinoma, it would be amazing if you'd get carcinoma in at least 150 sites as in this case, all arising at these different sites within a short space of time, say a month. I mean it would be extremely unlikely, because this patient's symptoms were due to the carcinoma that he had all over his lungs, not to the one lesion in the one lobe. And it's much more logical to me that he slowly developed a carcinoma of the left upper lobe and that he suddenly had a terrific spread of that to the rest of the lung.

We know he had metastases. He had metastasis to the mediastinum, outside the mediastinum to the cervical lymph node, and to the vertebra. We found tumor cells in the blood vessels. We found them in the lymphatics. Furthermore, nobody can show me in this specimen exactly where this tumor arose. As a matter of fact, before I would accept it as multiple primary, I would have to see some sites in which this tumor was arising. If this tumor had arisen in multiple sites, certainly there must be other sites where it was just arising when the patient died. And they are not present in that specimen.

Dr. Delp: Dr. Stewart, we are grateful to you, and I think I need say nothing more about this case.

ANATOMICAL DIAGNOSIS

Primary

Primary adenocarcinoma of lung, involving all lobes of both lungs with metastases to anterior cervical, periaortic hilar, tracheobronchial and mediastinal lymph nodes and vertebrae (history of chronic cough and marked dyspnea and orthopnea for two months before death).

Organizing thrombi (? emboli) of many branches of small pulmonary arteries, bilateral.

Arterionephrosclerosis, slight.

Hypertrophy of the heart, 450 grams, and dilatation of the right ventricle, moderate (history of hypertension for at least 12 months before death).

Arteriosclerosis of aorta, cerebral and coronary arteries, advanced.

Organized and recanalized thrombus of right middle cerebral artery.

Encephalomalacia of the parietal lobe of the right cerebral hemisphere and of the left internal capsule (history of cerebral thrombotic episodes 12 and 8 months before death, with residual weakness of right arm and leg).

Multiple petechial hemorrhages in mucosa of stomach, small and large intestines and ecchymoses in mucosa of small intestine.

Acute passive congestion of liver, spleen, and kidneys, moderate.

Edema of the lower extremities, advanced (history of multiple venipunctures).

Focal fatty metamorphosis of the liver.

Accessory

Focal fibrosis of heart.

Chronic bronchitis, slight.

Focal atelectasis and emphysema of all lobes of both lungs.

Congenital absence of middle lobe of right lung.

Multiple small adenomas of the liver.

Small calcified nodule beneath the capsule of the left lobe of the liver.

Nodular hyperplasia of the prostate, advanced, with small medial bar formation.

Focal area of infarction of prostate.

Multiple thrombi of veins in prostate.

Hypertrophy and trabeculation of wall of urinary bladder.

Cancer Society Meeting

The annual meeting of the Kansas Division, American Cancer Society was held at the Hotel Lassen, Wichita, October 10 and 11. Speaker at the banquet session was Mr. Edward F. Reid, Andalusia, Alabama, a cured cancer patient who devotes a large part of his time to work for the cancer organization.

At the business session Dr. Karl E. Voldeng, Wellington, was re-elected president. Mrs. Tom Stewart, Wellington, was named vice-president; Mr. Arthur H. Saville, Topeka, chairman of the executive committee; Mrs. Karl Leidig, Lenora, secretary, and Mr. Robert A. McClure, Topeka, treasurer.

Members-at-large of the executive committee are Dr. Howard E. Snyder, Winfield; Mr. Kean Tilford, Wichita; Dr. Robert H. Riedel, Topeka; Dr. Robert E. Stowell, Kansas City, and Dr. Orville R. Clark, Topeka.

Kansas Council for Children and Youth

The 12th annual meeting of the Kansas Council for Children and Youth was held at the University of Kansas Medical Center, Kansas City, October 14 and 15.

The address of welcome was given by Dr. W. Clarke Wescoe, dean of the school, after which Dr. Franklin D. Murphy, chancellor, discussed "The Institute for Exceptional Children." The following scientific program was presented: "Prevention of Poliomyelitis," Dr. Herbert A. Wenner; "Prevention of Rheumatic Heart Disease," Dr. A. M. Diehl; "Community Services of Child Study Unit," Dr. Harry G. Gianakon. Dr. Paul C. Laybourne and Dr. Edward D. Greenwood participated in a panel discussion on "Prevention of Juvenile Delinquency."

Subjects Announced for "Medic" Series

The new television program "Medic," sponsored by the Dow Chemical Company, will include the following subjects in the future: bubonic plague, November 22; hearing, November 29; unwed mother, December 6; traffic accidents, December 20.

DEATH NOTICES

Oliver David Walker, M.D.

Dr. O. D. Walker, 93, who served as president of The Kansas Medical Society in 1916, died at his home in Salina, October 6. He had retired from active practice about 15 years ago.

Dr. Walker was graduated from the College of Physicians and Surgeons, Keokuk, Iowa, in 1886, and he began his career as resident physician at the Haskell Institute, Lawrence. He then returned to Keokuk and remained there until 1905, teaching physiology, histology, and nervous diseases and serving as secretary of the faculty. He moved to Salina in 1905 and continued to practice there until his retirement.

Throughout his professional life Dr. Walker performed many services for medicine. His election to the presidency of the Society followed several terms as a member of the Council. He became a member of the Kansas State Board of Health in 1911 and later served as its president.

He was also an active participant in civic affairs, having spent a great many years as a member of the Board of Education in Salina and 10 years as its president. He was a charter member of the Salina Rotary Club.

James Carey Robb, M.D.

Dr. J. C. Robb, 75, an active member of the Ford County Medical Society, died at the hospital in his home city, Fowler, on October 6 after having suffered a heart attack that morning. A graduate of the Keokuk, Iowa, Medical College in 1901, Dr. Robb received his Kansas license in 1905. Since 1908 he had practiced in Fowler, and in 1950 he was honored at a community celebration recognizing his "valued and faithful service to his community."

Dr. Robb found young people of special interest, and he served as coach for one of Fowler's early football teams. He had also served on the school board in the community and was active in several fraternal organizations.

ACTIVITIES OF MEMBERS

Dr. A. M. Cherner, Hays, was principal speaker at a recent meeting of representatives of the American Cancer Society in that area.

Dr. Frank F. Merker, former chief of continued treatment at Winter VA Hospital, Topeka, has been appointed acting chief of professional services there.

Dr. Oscar W. Davidson and Dr. Lee H. Leger, Kansas City, have been appointed to serve as members of the board of directors of the Student Union and Dormitory Corporation of the University of Kansas School of Medicine.

Dr. Mary T. D. Glassen, Phillipsburg, has been chosen as chairman of the Kansas Council for Children and Youth.

At a recent meeting of the American Academy of Ophthalmology and Otolaryngology held in New York City, Dr. LaVerne B. Spake, Kansas City, was honored with the presentation of the organization's award of merit, a gold key.

Dr. Thomas L. Foster, Halstead, discussed "Understanding Each Other in the Home" at a recent Republic County Family Life Institute held at Belleville. He also spoke on "Mental Health Is Salina's Business" at a meeting of the Saline County Association for Mental Health.

Dr. Cora S. Crews, who has been practicing in Hiawatha, has moved to Iola and is now practicing there in association with Dr. Russell Nevitt.

Dr. John M. Porter, Concordia, addressed the Rotary Club in Kansas City on October 5. He told of changes that have taken place in methods of caring for the sick during the past 50 years.

Dr. Jere O. Osborne, who moved to Ness City in July, has announced the opening of an office there.

Dr. Stanley R. Friesen, associate professor of surgery at the University of Kansas School of Medicine, was recently elected to membership in the American Surgical Association and to associate membership in the American Association for Thoracic Surgery.

Dr. Carroll D. Behrhorst, Winfield, and Dr. Roscoe F. Morton, Arkansas City, were recently named part-time health officers for the northern and southern divisions of Cowley County.

Dr. Ernest P. Carreau was recently discharged from duty with the Navy and has returned to his practice in Wichita.

Dr. S. Albert Scimeca, who formerly practiced in Caney and in Wichita, has announced plans to open an office in Bucklin.

Dr. Roscoe F. Morton, Arkansas City, addressed the Lions Club there recently and compared methods of drug manufacture and medical care in Europe with methods in this country.

Dr. Alfred M. Tocker, Wichita, was speaker at a recent meeting of the Sedgwick County Medical Assistants' Society. His subject was "New Techniques in Cardiovascular Surgery."

Dr. George Lockett, formerly of Glasco, is now practicing in Moline.

Dr. J. Dean Gough, Chanute, addressed a recent meeting of nurses at Neosho Memorial Hospital on the subject of diabetic conditions.

Awards for service to the Kansas Tuberculosis and Health Association were presented to five physicians at the annual meeting of the organization in Kansas City last month. Those so honored were Dr. F. A. Trump, Ottawa; Dr. Dellett E. Bronson, Olathe; Dr. Clinton R. Lytle, McPherson; Dr. Clay E. Coburn, Kansas City, and Dr. Ralph I. Canuteson, Lawrence.

Dr. Hansel Benvenuti, medical director of the Sedgwick County Hospital, Wichita, during the

past three years, has announced plans to leave on December 1 to take charge of medical service at the Metropolitan Hospital, near Los Angeles.

Dr. Ballard Hayworth, who practiced at the Topeka Medical Center before he entered military service, has announced plans to practice in Redwood City, California, on his release from service.

Dr. Henry O. Hardesty, Jennings, who had practiced 54 years before he retired last summer, was the subject of a feature story in the *Norton Daily Telegram* on October 15 in connection with the observance of his 85th birthday.

Dr. Edmer Beebe, Olathe, announces that Dr. J. Robert Twinem, formerly of Garden City, is now associated with him in practice.

Dr. Franklin D. Murphy, chancellor of the University of Kansas, was featured speaker at the sixth annual Kansas Conference on Family Life held at Wichita, October 23.

Dr. A. E. Hiebert, Wichita, was speaker at a meeting of the Sedgwick County unit of the American Cancer Society on September 30.

Dr. Eugene Walsh, Onaga, has been appointed health officer for Pottawatomie County.

Dr. Donald L. Rose, Kansas City, has been elected third vice-president of the American Congress of Physical Medicine and Rehabilitation. Dr. Rose also serves as a member of the Board of Governors of the Congress.

Dr. Jack R. Cooper, Kansas City, addressed a meeting of nurses of District 2 at Bethany Hospital last month. His subject was neurosurgery.

A.M.A. Stand on Reinsurance

A résumé of the stand of the American Medical Association with regard to the government's reinsurance proposal was prepared last month by Dr. George F. Lull, secretary and general manager of the association. While in complete agreement with the objective, "to encourage and stimulate private initiative in making good and comprehensive health services generally accessible on reasonable terms," the A.M.A. opposes reinsurance for the following reasons:

1. The mechanism suggested would not accomplish the stated purposes of the bills.
2. The phenomenal progress of the health insurance industry makes federal intervention not only unnecessary but a dangerous intrusion into a successful area of private enterprise.
3. "Reinsurance" would not make health insurance more attractive to persons who can afford to pay premiums and have not done so. It would not make health insurance available to the indigent unless the government provides a subsidy for the purpose of selling insurance at less than the cost of servicing the contract.
4. The program, without subsidy, would not make health insurance available to any additional groups or geographic areas that voluntary insurers cannot reach.
5. Most insurance authorities agree that the extent of health insurance liability is such that a federal reinsurance program is absolutely unnecessary.
6. The bills would give the secretary of the Department of Health, Education and Welfare an extensive but unjustified regulatory control over the nation's health insurance industry.

Psychiatric Association Meets

The annual meeting of the Mid-Continent Psychiatric Association, branch society of the American Psychiatric Association for the states of Arkansas, Kansas, Missouri, and Oklahoma, was held in Little Rock, September 18 and 19.

Dr. Paul Hines, Kansas City, Missouri, was elected president. Other officers are: Dr. Harold W. Sterling, North Little Rock, vice-president and president-elect; Dr. Frank F. Merker, Topeka, secretary-treasurer, and Dr. William Rottersman, Topeka, councilor for Kansas. Dr. Rottersman took part in the program, presenting a paper, "New Hope for State Mental Health Program."

Nearly 400,000 nurses, an increase of 16,000 since 1950, are now working in the United States, according to figures released recently by the Public Health Service. Although 389,600 of the total are now in active practice of their profession, the demand for nursing services is so great that the present recruitment goal for the nation is 55,000 student nurses a year.

COUNTY SOCIETIES

Dr. V. C. Wiksten, Topeka, was guest speaker at a recent meeting of the Montgomery County Medical Society. He discussed allergies.

Members of the Cancer Committee of the Sedgwick County Society presented the program at the October meeting of the organization. Dr. F. L. Menehan served as moderator. The following speakers took part: Dr. C. T. Hinshaw, "Respiratory Tumor"; Dr. T. C. Hurst, "Local Incidence Statistics"; Dr. J. G. Lockhart, "Neuromas and Neurofibroma"; Dr. W. F. McGuire, "Kidney Tumors," and Dr. V. L. Scott, "Leukemia."

The society's 28th annual tourney was held this fall at the Rolling Hills Country Club. Dr. H. Lee Barry and Dr. Robert P. Norris received golf prizes. A tournament dinner followed the sports events.

Dr. Alfred P. Bay, superintendent of the Topeka State Hospital, presented a group of speakers from the hospital at the October 4 meeting of the Shawnee County Medical Society, Topeka. Ten-minute presentations were given as follows: "Changes in the Topeka State Hospital Since 1948," Dr. William Simpson; "Admission Procedures," Dr. George W. Jackson; "Basis of Psychiatric Treatment," Dr. J. G. Graybill; "Workup of the Psychiatric Patient," Dr. William Tarnower; "Problems in Psychological Medicine," Dr. Aron Arnow; "Child Psychiatry," Dr. Joseph Noshpitz; "Out Patient Treatment—Advantages," Dr. Howard V. Williams, and "Training Programs," Dr. Paul E. Feldman.

The Shawnee County Medical Society was host to the Golden Belt Medical Society at a meeting held at the Jayhawk Hotel, Topeka, October 14. Dr. Richard C. Tozer, Topeka, presented a paper, "Care of Head Injuries," and Dr. William L. Valk, Kansas City, spoke on "The Clinical Evaluation of Renal Function."

A meeting of the Montgomery County Society was held on October 20 at the Coffeyville Country Club. Speaker of the evening was Dr. William G. Norman, who has been in practice for 56 years. Dr. Norman was named by the group as its "Doctor of the Year."

A meeting of the Wyandotte County Society was held at the Town House Hotel, Kansas City, October 19. Dr. Frank F. Allbritten, Jr., chairman of the department of surgery, University of Kansas Medical center, presented a paper on "Carcinoma of the Lung." The organization in Wyandotte County now numbers 209, 18 new members having been accepted during the first nine months of the year.

Members of the Marion County Society met at the Kingfisher Inn, Marion, October 5. Dr. Robert D. Wood, who recently opened an office in Peabody, spoke on "Pre-Anesthetic Medication."

A meeting of the Labette County Society was held at the Parsons Country Club on October 13. Speaker of the evening was Dr. Stanley S. Peterson, Springfield, Missouri, who discussed the Red Cross blood program.

Clinics on Television

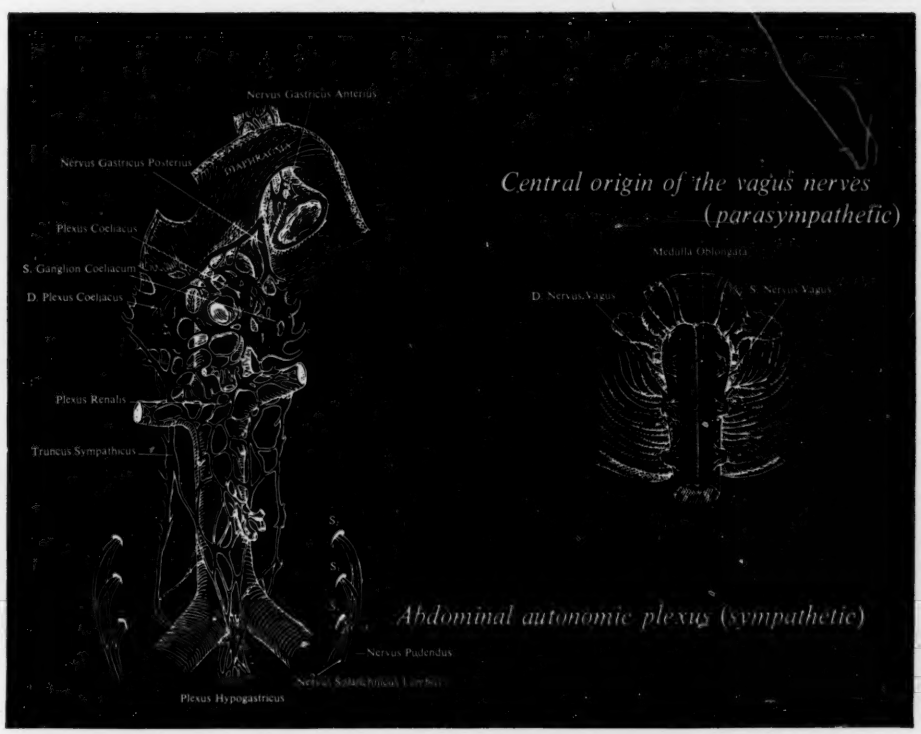
An experiment in the use of open-channel television for postgraduate medical education was termed successful when tried recently by the Division of Graduate and Postgraduate Medical Education of the University of Utah. With facilities and time made available by a Salt Lake City station, the university telecast "clinics" once weekly for four weeks.

The series covered x-ray diagnosis of calcifications in the abdomen, gastrointestinal hemorrhage in the elderly patient, the approach to congenital heart disease, and a diagnostic clinic. Programs were presented from 7:00 to 8:00 a.m.

A survey made later indicated that 48.9 per cent of the potential doctor audience viewed the telecasts. Seventy-four per cent of the viewers reported that they had learned new facts, 61 per cent felt that their "previous knowledge had been revitalized," and 53 per cent acknowledged renewed interest in a specific field.

The Kansas State Board of Health reported an increase in the number of cases of encephalitis in Kansas during the month of September. One city, Colby, reported eight cases, one of which was fatal. Other cases were reported from the following counties: Hamilton, Marshall, Clay, Butler, Jefferson, Bourbon, and Trego.

Blue Shield plans have passed the 30 million mark in enrollment nationally.



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1. Zupko, A. G.: Pharmacology and the General Practitioner, GP 7:55 (March) 1953.

2. McHardy, G. G., and Others: Clinical Evaluation of Methantheline (Banthine) Bromide in Gastroenterology, J.A.M.A. *147*:1620 (Dec. 22) 1951.

THE KANSAS PRESS LOOKS AT MEDICINE

Editor's Note. In this section the JOURNAL *reproduces editorials relating to medicine which have appeared in the lay press. An effort is made to include both favorable and unfavorable comments, and the Editorial Board in no instance assumes responsibility for the opinions expressed.*

The Coroner Question

Some of the brothers are giving out words about county coroners. Somebody brings up the proposition that the coroner system in Kansas should be overhauled. Specifically, the matter seems to have been raised because in many counties undertakers seek the office of coroner and frequently they are successful. A former legislator, a top pathologist in Kansas, thinks that Kansas should change its coroner system so as to make it necessary for a corner to be a physician. A doctor says that it is easy to get away with murder in Kansas. A murder may be committed and a coroner who is not a doctor will render an official decision that is not accurate.

A law to create county examiners, such persons to be appointed from a list of qualified persons by the county commissioners, is suggested. It is not the first time the proposal has been up. Two legislatures have defeated such a proposal. The defeats have been attributed to politics.

It is pointed out that the duties of a coroner have quite a vital effect on many matters including insurance. Permitting the job to go to someone who can get the votes to be elected without the qualifications creates a bad situation.

The coroner, it will be recalled, is the second most important officer in the county—at certain times. The most important is the sheriff. He is the chief executive officer of the county. If the sheriff cannot act or if he must be arrested, the coroner is the officer who takes over for the disqualified sheriff. That is of far less importance, however, than the responsibilities of the coroner in his ordinary run of events in the county. The proposal which is being made surely will have some merits. It is pointed out that it is possible for someone to be murdered by poison in Kansas without the public being advised. The coroner who is not a doctor will not know the difference between a fatal heart attack and poison. An autopsy would be required to get at the truth. With a physician as a coroner he can proceed with an autopsy. If he is not a doctor he cannot, obviously. The office is one where politics or political attainments cannot substitute for professional knowledge and qualifications.

The next legislature could well afford to deal with this problem of the coroner system on its merits. —*Pittsburg Headlight, September 22, 1954.*

Aid for the Indigent

The American Medical Association has long been a whipping boy of those who want socialized medicine, or government-bossed medicine, or some variant thereof. The idea has been disseminated that this organization, which represents the vast majority of the country's physicians, is opposed to better medical care, and isn't at all concerned with the problems of indigent people.

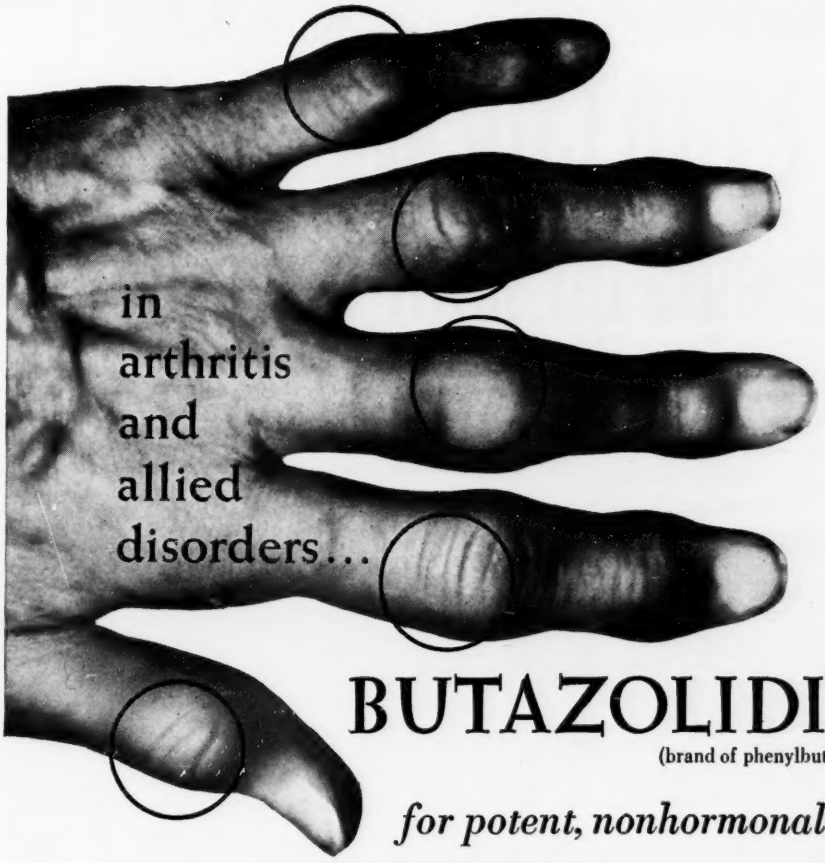
Nothing could be farther from the truth. The AMA has been directly and indirectly responsible for some of the great medical advances of all times. It has thrown its weight solidly behind the voluntary health insurance movement, and has been a positive factor in that movement's extraordinary growth.

What the AMA does oppose are schemes which would inevitably reduce the standards of medical care and put the bureaucrat in the driver's seat. A spokesman put the case accurately when he said: ". . . it is essential to consider two groups of individuals: (1) those who are able to pay the normal costs of medical care, and (2) those who are indigent. Most of the American people fall within the first group. . . . The other group—the indigent—poses distinctly different problems. . . . If the medical care problems of this group cannot be solved by the individuals or their families, the responsibility should be assumed by the local and state government."

Every community's problem is different, and can be solved locally. And aid for the indigent is a basic local responsibility—not a federal function.—*Industrial News Review, reprinted in Topeka Capital, September 18, 1954.*

A record graduation of 6,861 physicians during the past year by our nation's medical schools has boosted the ratio to an all-time high of one physician for every 730 persons in the United States. This ratio will be lowered even more in the next few years as the number of medical graduates is expected to rise.

Today's physician population has now reached approximately 220,100. Enrollment of 28,227 is the largest number of medical students in history in this country. The freshman class enrollment of 7,449 is also a record.



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*MacKnight, J. C.; Irby, R., and Toone, E. C., Jr.: Geriatrics 9:111 (Mar.) 1954.

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Some Basic Concepts of the Acute Radiation Syndrome

Eugene T. van der Smissen, M.D.
Baltimore, Maryland

Christmas eve, 1895, can be said to have ushered in an era that has revolutionized both medical and physical sciences. It was on this date that Professor Wilhelm Konrad Röntgen (Roentgen) announced his discovery of x-rays before the German Physical Society. Prior to this time men had experimented with the Crooke's tube, but Roentgen was the first to discover the "magic ray." From this beginning many divergent paths lead into the various sciences of physics and medicine.

The discovery of Becquerel rays in 1896 and the isolation of radium in 1898 were further steps along these pathways. Following the discovery of radium in 1898, physicists all over the world began to seek explanations of the cause of radioactivity.[1] This ultimately led to the formulation of the Einsteinian equation $E=mc^2$ and the production of the atomic bomb. This again brought nuclear physics and medicine together, for the bomb produced thousands of cases of injury from radiation. Prior to the explosion of the bomb in 1945, the cases of injury from radiation were confined to those cases of x-ray irradiation and to those persons who worked close to radium, such as watch dial painters. We have learned about radiation injury slowly and painfully. The first x-ray burn was reported in 1896, but it was not until 1915 that there was general recognition of the danger of x-ray.

As with any new discovery, there are those who propose it as a "cure-all," and so it was with x-ray irradiation and with radium. In the 1920's tonics were prepared from radium salts and sold as "cure-alls," and many people died subtle, lingering, painful deaths. Others believed that radiation was stimulating to the body, and many followed in their false beliefs and died.[2]

Unfortunately, for a period of time many doctors were not informed as to the dangers of mass radiation, but in 1945 the syndrome of acute radiation sickness became well known to a large portion of the medical and lay population of our country. Since 1945 much has been written about nuclear energy and the syndrome of acute radiation sickness.[3, 4, 7] It is our purpose to gather together some of the basic knowledge of this syndrome.

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school.

Thesis written while the author was a fourth year student. Dr. van der Smissen is now interning at the United States Public Health Service Hospital, Baltimore, Maryland.

SIGNS, SYMPTOMS, AND DIAGNOSIS

The diagnosis of the injury sustained from a single exposure to whole body radiation arising from an external source will not be difficult if the history of exposure is known. However, in the absence of such a history, there are numerous other diagnoses which will occur to the physician as an explanation of the signs and symptoms. Correct diagnosis depends upon proper evaluation of three factors:[5]

1. Was the patient exposed to sufficient radiation?
2. The development of typical symptoms.
3. The occurrence and the time-trend of leukopenia and lymphopenia.

The mechanism of radiation injury is not known, but there are many theories and fragments of knowledge concerning its effect upon biological material. These will be discussed in a later section.

Two entities are considered when one studies the problem of radiation injury. One, commonly called "Radiation Disease," is that entity which follows chronic exposure or exposure of a limited area of an individual to therapeutic x-ray or radioactivity; the other, the one with which we are concerned, is called "Radiation Syndrome" and is composed of those signs and symptoms which follow acute, whole body, penetrating radiation exposure. As far as is known, these symptoms and signs are the same in pure radiation injury as in cases of radiation injury accompanied by burns or trauma.

These symptoms, in general, appear first in those more radiosensitive systems of the human body. There is no one symptom or laboratory test that can diagnose radiation syndrome, but there are certain specific and suggestive symptoms which combine into the complex known as the radiation syndrome. The earlier the appearance of these so-called specific or suggestive symptoms, the more severe the radiation injury.[5]

Dunham[5] lists the specific symptoms of radiation injury as epilation and purpura and the suggestive symptoms as vomiting on the day of exposure, oropharyngeal lesions, and hemorrhagic manifestations.

In the Japanese bombings only 5 to 15 per cent of the casualties were caused by ionizing radiation alone.

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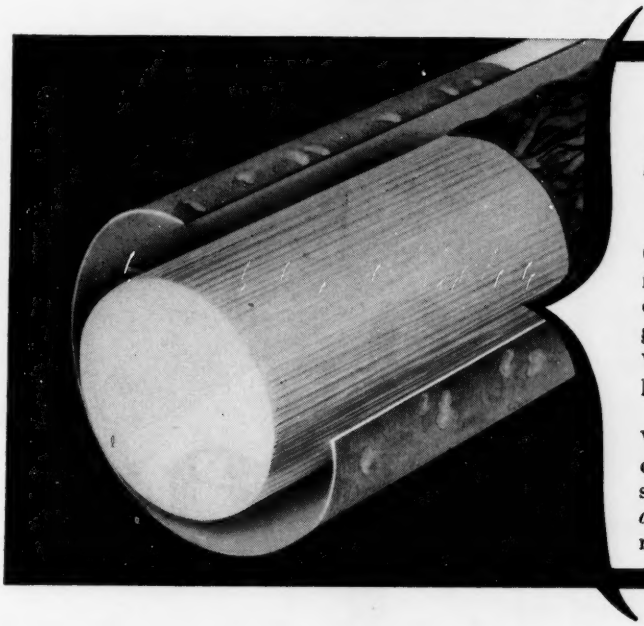

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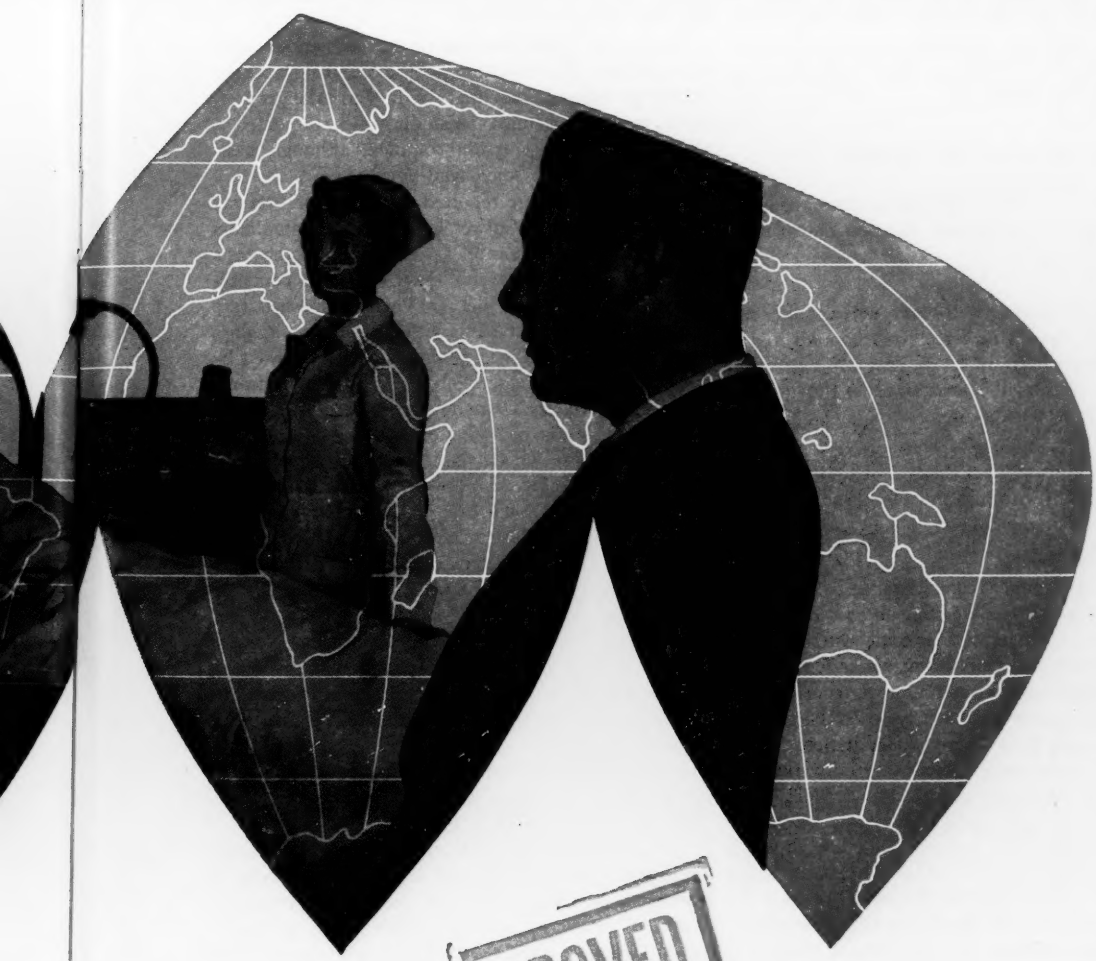

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The radiations produced by these bombs consisted chiefly of neutrons and gamma rays. The clinical syndrome of uncomplicated radiation injury (i.e., pure radiation, no trauma or burns) in these bombings can be divided into four phases.[44]

PHASE 1

Onset—an hour or so after exposure.

Duration—a day or two.

Symptoms—prostration, shock-like states, nausea, vomiting, and sometimes diarrhea. Death may occur.

PHASE 2

A period of relative well-being between Phases 1 and 3. Patient may feel well enough to go back to work.

Duration—varies; the shorter it is, the greater the amount of exposure.

PHASE 3

Developing fever, diarrhea, epilation, hemorrhagic manifestations, and ulceration. It is the main part of the illness.

PHASE 4

Death, or prolonged convalescence.

Few of these symptoms are seen immediately; they take some time to develop. Other toxic symptoms develop immediately after or during radiation. These symptoms resemble shock, and there is considerable evidence that the greatest effect may be on the adrenal cortex. In this early phase there is dehydration, fall in blood pressure, tachycardia (which varies directly with the amount of radiation absorbed), dyspnea, and extreme prostration; other toxic symptoms are vomiting, nausea, diarrhea, and malaise. They last 24 to 48 hours, and then there is a latent period. The duration of this latent period depends upon the intensity of the dosage of radiation, being shorter when the dosage is greater. This is followed by more intense symptoms and new symptoms related to the hemopoietic system. Physiopathologic manifestations involving adrenal function, the adaptation syndrome, intoxication by histamine-like substances, and bacterial invasion also take place.

In the Japanese bombings epilation began during the second week after exposure, and regrowth started about the sixth week. In the survivors it was complete in four to five months. The cutaneous purpura usually did not appear until the third week. Besides the hemorrhagic manifestations other than purpura (epistaxis, menorrhagia, hematuria, metrorrhagia, melana, hemoptysis, and hematemesis), severe whole body radiation injury produced leukopenia, anemia, and thrombopenia.

Of the suggestive symptoms of radiation injury, the oropharyngeal lesions occurred prior to the 39th day. These were composed of dusky inflammation of the mucous membrane, soreness of the gums, and ulcer-onecrotic tissue breakdown.

There is a difference in reactions from various types of radiation. The radiation of the original Japanese bombings was soft, but that of the Los Alamos accidents was hard gamma radiation which presented a slightly different symptom complex, although basically both were the same syndrome.

In 1948 there were reported four cases of beta ray burn in personnel at Eniwetok. Their chief complaints were burning and itching. During the H-bomb tests on March 1, 1954, several fishermen were contaminated with radioactive debris. Their symptoms were somewhat different, starting with burning and itching, then gastrointestinal symptoms occurred, followed by blistering and progressing into the radiation syndrome Stage II or III (see chart on page 662).

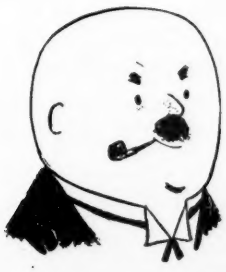
The only cases of radiation syndrome in human beings are those which were the result of accidents (such as those cited by Hempelmann[7]), x-ray overdosage, or bombs. The dosage was not accurately known, nor were adequate controls run. One can only extrapolate from animal experiments as to the probable dosage ranges for the various types of radiation syndromes.

Some authors believe that an acute dose of 200 or more r will prove fatal to humans, whereas others set the minimum at 300 r; obviously the greater the dosage the greater the percentage of fatality. In acute total body radiation 400 r $\mp$ 100 r is considered the median lethal dose, the LD-50; and those of greater than 600 r are considered 100 per cent fatal, or LD-100.[5, 6, 10]

The radiation syndrome can be classified roughly into three groups, using the dosage and severity of symptoms as a basis: these are Group I (very severe), Group II (severe), and Group III (mild or moderate). Group I shows the only true primary radiation syndrome. The others start with the same symptoms, but other symptoms develop as a result of the ionization effect upon the hemopoietic system. These groupings are compared in the following chart.

Knowlton,[8] after extensive study of the value of blood counts in individuals exposed to ionizing radiation, concluded that, although the routine blood count is a poor detector of radiation injury in chronic radiation, it is still the best laboratory test available.[11] The lengthening of the prothrombin time also has been suggested as a means of detecting over-exposure to radiation.[12] There is no single laboratory procedure which is diagnostic, but the over-all blood picture shows pancytopenia and anemia. The symptoms of thrombocytopenic purpura and agranulocytosis also are seen.

It has been reported[7] that the anemia is of the macrocytic hyperchromic type.



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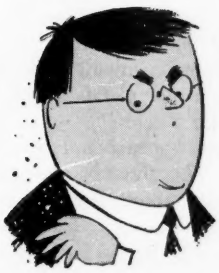

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TYPES OF RADIATION SYNDROME AND THEIR SIGNS AND SYMPTOMS[5, 6]

GROUP I	GROUP II	GROUP III
Very severe cases	**Severe cases**	**Mild to moderate cases**
Primary type of radiation sickness.	Effects secondary to the effect of radiation on the hemopoietic system.	
LD-100 dosage. 600 r, or more, total body exposure (acute).	LD-50 dosage. About 400 r acute total body exposure	Less than LD-50 dosage. 200-300 r acute total body exposure.
	1st DAY	
Beginning in 1-2 hours: malaise, nausea, vomiting, asthenia, moderate diarrhea, and prostration. Rapidly developing and persistent leukopenia.	Beginning in a few hours, rarely continuing more than 24 hours: nausea, vomiting, diarrhea, lymphopenia.	Vomiting may occur in a few hours. Symptoms and signs not constant.
	NEXT FEW DAYS	
May go on to immediate exhaustion and death in a few days. Others have spontaneous remissions of 2-3 days with only malaise and then a return of symptoms with: sanguinous diarrhea, progressive sustained fever, thirst, emaciation, and extreme dehydration.	Second day shows lymphopenia of 800 lymphs/cu. mm.	No definite symptoms. Moderate lymphopenia.
	4th to 20th DAYS	
Death in 10-14 days, but may die within a few hours of exposure. Death in shock, exhaustion, coma, and delirium.	First a latent period of 8-10 days relatively free from symptoms and may even go back to work. May have some malaise and fatigability.	No definite symptoms for two weeks, then may have: epilation, malaise, sore throat, petechiae, diarrhea, or weight loss.
Purpura and epilation may appear shortly before death. Hemorrhagic manifestations do not seem to be responsible for fatal outcome.	Then, at any time up to the 20th day, the individual may become seriously ill, show any or all of the following symptoms: agranulocytosis, and/or thrombocytopenic purpura; epilation (scalp chiefly) at end of second week; nausea, vomiting, diarrhea, anorexia, and prostration; unremitting fever; infection and wound breakdown; severe leukopenia and general sepsis, melana, epistaxis, and hematuria; menorrhagia and metrorrhagia; petechiae, ecchymosis, and hemorrhage; ulcerative gastritis and enteritis; oropharyngeal ulcers.	
	In 20-40 days death occurs in 50 per cent of the untreated cases. Death is usually due to sepsis or with hemorrhagic manifestations dominating the picture.	

The rapidity of onset of the various hematologic findings is determined by the susceptibility of the various cells to radiation and by the intensity of radiation. The following is a table of the responses of the three groups of radiation.[10, 27]

THE HEMATOLOGIC REACTION

GROUP I	GROUP II	GROUP III
Lymphopenia (10 per cent of normal in first 30 hours).	Granulocytes drop to a few hundred.	Variable blood changes.
WBC falls to 2,000/cu. mm. and may drop to 200.	Platelets fall to 10,000/cu. mm.	Moderate leukopenia.
Red cells show little adverse effect as their life span is 120 days.	Agranulocytosis.	Moderate anemia.
Reticulocyte counts reflect the bone hypoplasia.	Thrombocytopenic purpura.	
Purpura and anemia are NOT characteristic.	Aplastic anemia after 4th-5th week.	
	Increased capillary fragility and heparin disturbance.	

The laboratory procedures are standard for the above determinations and are known to all. In general, the hematologic picture may indicate the prognosis and severity of the disease. If the total white blood count is less than 500/cu. mm., recovery is unlikely. The lymphocytes are even more indicative in that a total lymphocyte count of greater than 1,500/cu. mm. at 48 hours after exposure indicates that radiation injury of clinical significance is unlikely. On the other hand, a total lymphocyte count of less than 800 cells/ cu. mm. at 48 hours after exposure is presumptive evidence of severe radiation injury.

Total neutrophile counts drop more slowly, but if they reach less than 1,000 cells/cu. mm. within one week the outcome is usually fatal. With less severe doses, and less danger of fatality, the drop takes 10 to 20 days to reach this level.

The thrombocytopenia and the purpura develop more slowly. The thrombocytes remain stable for three to four days and then have a rapid drop, nearly to zero in the second week. They remain low for two to four weeks. This would indicate that the fault lies not in the circulating thrombocytes but in the development from the megakaryocytes of the bone marrow.

Anemia is the slowest to develop of the blood dyscrasias, and it is the most persistent. It takes two to three weeks to develop and attains its lowest point in about four to five weeks. As would be expected, any rapid drop in hemoglobin, red count, or hematocrit suggests rapid blood loss.

The reticulocyte count is one of the best indicators that the patient is recovering. The reticulocytes will be absent for almost three to four weeks, and then any rise is a good sign.

Gastrointestinal symptoms occur in two phases. The first is related to the radiation itself and is manifest by nausea and vomiting; the second is the bacterial overgrowth from the intestinal tract due to reduction

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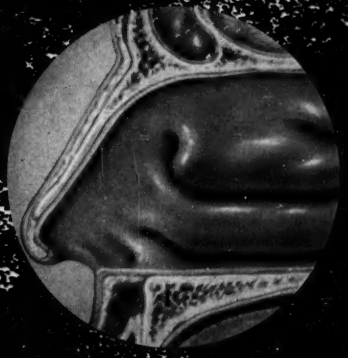

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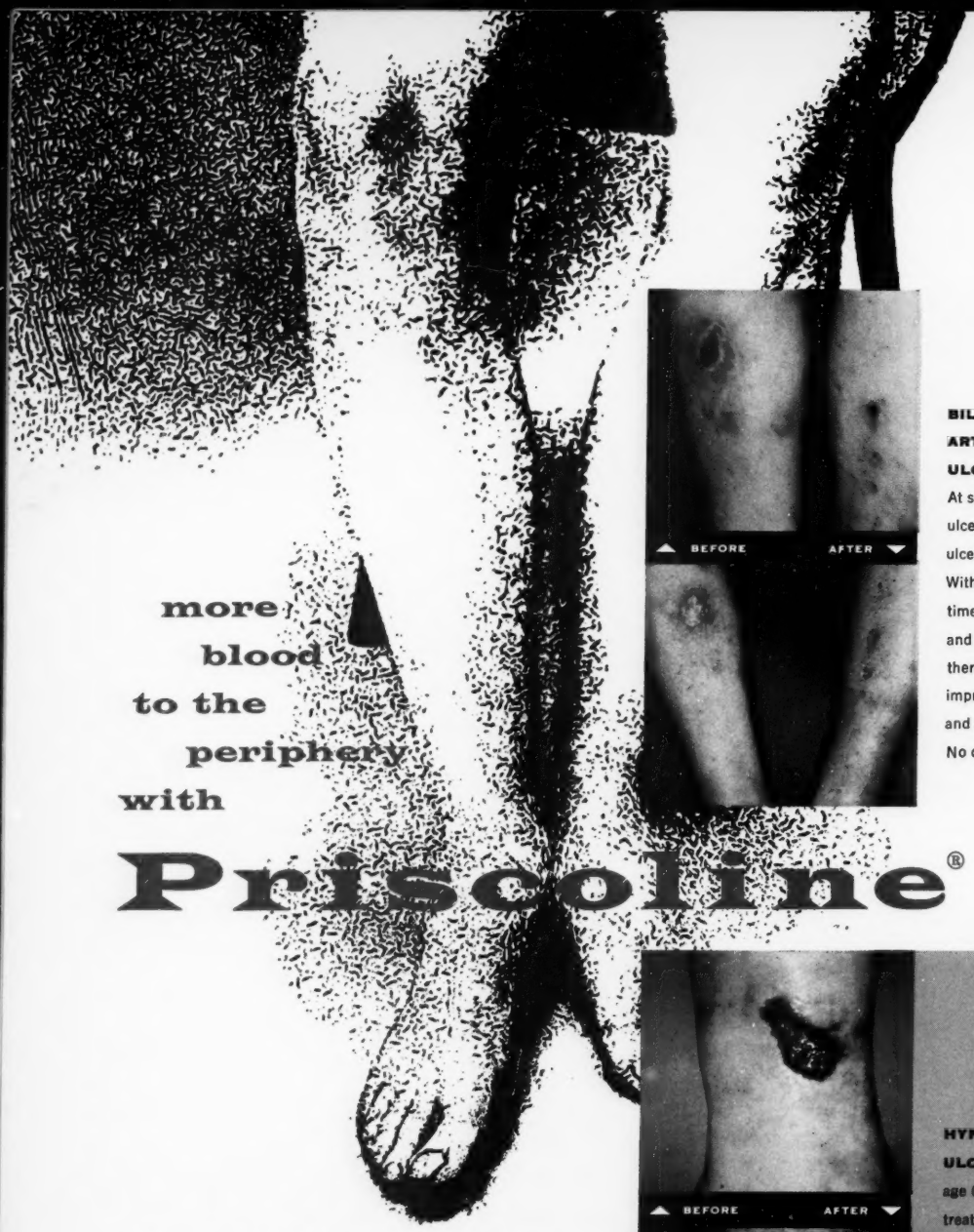

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of body defenses, and this is shown by sanguinous diarrhea and necrotizing ulcers.[6]

As is to be expected, deaths in the various groups are due to differing immediate causes. Those of Group I who die within a few hours of exposure do so from shock and exhaustion; those who linger a while go into coma and delirium, and then die. The exact cause of death is unknown, but probably it is due to the ionization affecting the enzyme systems.

Deaths in the severe cases (Group II) are usually due to:[5] (1) acute blood loss, (2) septicemia, and (3) hemorrhage into vital structures.

Those who die in Group III usually do so as a result of complications, not directly due to radiation. These complications most often affect the respiratory system and are usually fatal after the sixth week. In such cases one sees: (1) bronchiectasis, (2) chronic abscesses, (3) tuberculosis, and (4) refractory anemia.

Those 50 per cent in Group II who survive continue to have symptoms for weeks and months. A few instances of ocular cataract have been observed in survivors of the Japanese bombing, and in the Los Alamos accidents it was found that several of the exposed persons of relatively young age developed cataracts rather rapidly and that these closely resembled the senile type of cataract.

The early reaction seen in Groups I and II is the true radiation syndrome and is caused purely by the radiation absorbed and its ionization. Peculiarly, the intensity of these primary symptoms varies and is not correlated with radiation dosage received.[16] In both groups this initial reaction is followed by a latent period. The duration of this period depends upon the intensity of the dosage of radiation, being shorter with a greater dosage. In Group I the symptoms that return after the latent period are the same as those preceding, only more intense; those in Group II are slower coming on and are ordinarily of the nature of those evident in hemopoietic failure and bacterial invasion.

The full significance of late or delayed radiation effects is not known because of two factors: one, so few cases of radiation exposure have been studied, and two, insufficient time has elapsed since exposure to bring out the latent or genetic effects. Latent reactions usually develop years after exposure, and a latent interval of 25 to 30 years would not be considered uncommon.

Below are listed the possible latent effects of radiation:[44] (1) adult cataracts, (2) skin cancer at site of exposure, (3) leukemia, (4) aplastic anemia, (5) other forms of cancer, (6) developmental anomalies, (7) sterility, (8) shortening of life span, and (9) genetic mutations in germ cells.

THERAPY

To date there is no standard, specific treatment for this radiation syndrome. Practically all drugs in the pharmacopeia and all types of treatment known have at one time or another been proposed as therapy for radiation syndrome. Various vitamins, liver extracts, and insulin have been hailed as preventive or curative agents, but they have not yet been proved effective. Lacking a specific treatment, we must fall back on symptomatic therapy.

The basic principles of treatment are: (1) proper fluid and electrolyte balance, (2) adequate, good nutrition, (3) sedation as indicated and sufficient rest, (4) whole blood transfusions as indicated and treatment of hemorrhage and anemia, (5) antibiotics to stem septicemia, and (6) additional therapy for concomitant conditions such as burns or trauma.

The patients in Group II classification make up a group in which good medical treatment can either save or lose a life. Rarely will one save a patient from Group I.

Early use of saline and 5 per cent glucose will save time and effort in combating acid-base imbalance and dehydration brought about by diarrhea and vomiting. Once dehydration and acid-base imbalance have developed, the problem becomes more complicated.

Adequate nutrition should include a bland low-residue high-calorie diet (3,000 to 4,000 calories per day) with high protein (150 to 200 grams per day). Both oral and parenteral routes must be employed. It is noted that 1,000 cc. of plasma (derived from 2 liters of blood) will contain 50 to 60 grams of complete, well balanced protein and represents about 250 calories.[13] One drawback is that the continued use of plasma tends to retard red cell production. To offset this, fresh whole blood should be used if possible. Large amounts of citrated blood will bind the blood calcium and cause hypocalcemic tetany. To forestall this, judicious use of calcium gluconate is indicated.

The use of many drugs and vitamins has been advised. Many so-called "specific" therapeutic measures have been advocated. Among these are sulfhydryl agents to reverse the enzyme inhibition; antihistamine compounds to neutralize toxins and released histamine-like compounds; adrenal hormones to replace losses; agents to maintain water and electrolyte balance; prophylactic antibiotics; the prevention and treatment of anemias and hemorrhagic tendencies; and means to prevent and remedy the marked loss of tissue and negative nitrogen balance.[9]

At one time antihistaminics were thought to be beneficial. It is now known that although antihistamine ointment may aid in protecting the skin during radiation therapy,[14] when taken internally antihistamines have a synergistic effect with radiation and increase its lethality in experimental animals. Antihistaminic drugs cause a pronounced leukocytosis in normal guinea pigs that receive the drug daily for periods of 14 to 23 days. Gallbladder rupture and

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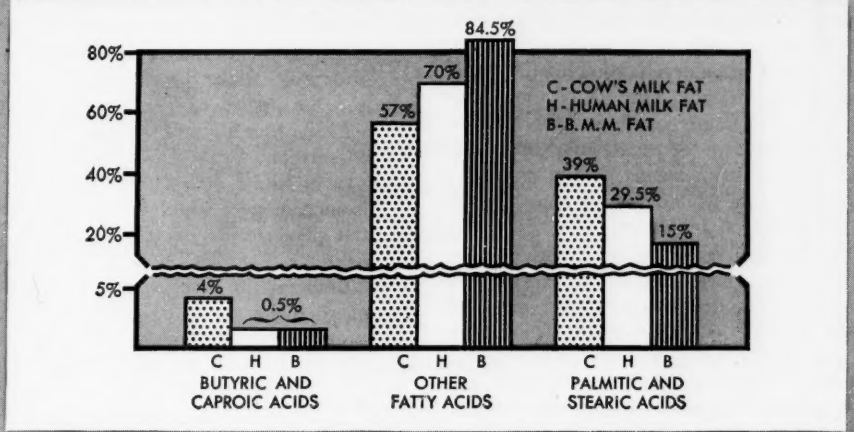

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enlargement of the common duct and gallbladder are observed in chronically medicated and irradiated guinea pigs. There is also a significant decrease in coagulation time in these animals.

There is no doubt of the value of blood transfusion in the initial shock phase, but what added advantage does it give? Allen[17] has shown that less severe irradiation anemia is the only benefit noted. Thus we assume that in other than the shock phase, it is well to reserve whole blood transfusions for those patients who show clinical bleeding, a white blood count of 1,000 or less, or a hemoglobin of less than 70 per cent. It is best to maintain hemoglobin at 10 grams or more.

Wide spectrum antibiotics (aureomycin, terramycin, etc.) seem to be valuable in combating infection, especially of certain gram-negative intestinal bacteria and in controlling diarrhea. The use of these antibiotics the day of exposure, continuing for 21 days, is to be recommended if the supply of antibiotics is adequate. Dosage is in the range of 500 mg. every six hours. Once severe symptoms have appeared, use both oral and parenteral antibiotics.

So far we have discussed therapeutic measures after exposure. There are many studies in experimental animals which indicate that certain prophylactic measures may be effective in combating the acute radiation syndrome. Prophylactic cysteine,[19] estrogens,[18] or glutathione[20] in tests with mice have significantly lowered the expected mortality of lethal dosage radiation. Oxygen deprivation or cyanide intoxication during exposure to lethal dosages of irradiation also reduced expected mortality. None of these agents are of value if administered after the radiation exposure has occurred.

Jacobson[23, 24, 25] has demonstrated that shielding the spleen of mice during exposure, or transplantation of as little as 10 mg. of fresh spleen to mice after exposure to lethal dosages of x-irradiation, increases survival and hastens regeneration of blood forming tissue and of the gastric lining and the intestinal tract.

This study strongly suggests the presence of a chemical substance in normal tissue capable of hastening regeneration and repair of irradiated tissue. Recent experiments of Cole, Fishler, and Bond[45] seem to bear this out. Straube[26] finds that the adrenals are apparently involved only secondarily as part of the organism's buffer response to the stress of irradiation. The rationale of employing adrenal corticoids to alter radiation mortality is therefore open to question.

Other substances such as the so-called anti-heparin materials (protamine and toluidine blue) and vitamin K (other than the natural vitamin K) have been of little value either as prophylactic or as post-exposure treatment.

PATHOLOGY OF RADIATION INJURY

What is the mechanism by which high-energy waves and particles damage living things? A large number of investigators have been working on this problem and find that the farther they go into it, the more complex it becomes. The syndrome is initiated by protoplasmic injury, through the following mechanisms: (1) enzyme inhibition, particularly sulfhydryl enzymes; (2) some alterations in osmotic properties and cell permeability; (3) generalized protein denaturation, and (4) an intoxication by histamine-like compounds supposedly liberated as a result of radiation.

There is a reciprocal relationship between the degree and reversibility of the enzyme inhibition, the protein denaturation, and the alterations in osmotic properties and cellular permeability. As the dosage increases, the degree of reversibility decreases, and the mortality rises.[9] Fundamentally these effects are due to radiation's ionizing action on the atoms and molecules of which the tissue is composed.

This ionization is based on several mechanisms: (1) the photoelectric effect in which one of the electrons of the atom is ejected; (2) the Compton effect based on the acceleration of a slow moving electron to higher velocity; (3) pair production to produce a positive and a negative electron; (4) direct strike of radiation on a nucleus causing nucleus acceleration, and (5) formation of a radioactive nucleus as the result of the absorption of a particle by the nucleus.

These mechanisms combine to damage the cell by one or both of two effects:[27] (1) radiation (particle or wave) can strike the nucleus or pass through the protein molecule denaturing it, and (2) by manufacturing reactive groups of atoms that pass through the cell wall and react with the enzyme systems.

These may affect cells in various ways. It may kill the cells outright, it may interfere with their growth, it may change their genes and heredity. The problem of acute radiation syndrome is concerned with the first two possibilities as causes of immediate symptoms. The effect upon the genes and heredity may be delayed several generations before it shows up in the cells as a mutation.

The most common effect, since cells are 70 per cent water, is the ionization of water to HOH^+ which breaks down to $H+$ and $OH-$ or OH. These can react together with HOH and O_2 to form H_2O_2 (hydrogen peroxide). This in turn breaks down into HOH and nascent oxygen, and the free radicals OH and HO_2. These agents are powerful oxidizing substances and can react with cellular material and interfere with its normal chemical activities. This action causes the disruption of the enzyme systems and vital functions of

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most of the body cells, and death occurs promptly without much evidence of morphological change.[28] This is typical of the sudden deaths or deaths within a few hours of heavy acute radiation, but those with less heavy radiation show less effect and go on to various stages of necrosis and tissue reaction.

It is postulated[27] that these oxidizing agents have their greatest effect upon the sulfhydryl groups (SH) of the enzyme systems. By oxidizing this group they put the enzyme out of action. Putting the enzyme system out of action cuts off the respiratory function of the cell, and the cell dies. If the enzymes have received only a moderate dose of radiation, this oxidation may be reversed by appropriate compounds.

These same radiations may cause breaking of the chemical bonds of proteins, changing of nuclear material (possibly by its effect upon desoxypentosenucleic acid), and the formation of mutations. Tahmissian[29] learned that anabolic enzymes were found to be associated with the nucleus material and were more susceptible to radiation damage than catabolic enzymes; in a resting cell a nucleus was found to be necessary for the maintenance of the status quo. Pyknosis of the resting nucleus was found to depend upon x-ray dosage, state of metabolism, and time. Repression of irradiation damage to the cell could be obtained by subjecting the cells to sub-metabolic temperatures. As is to be expected, those cells most radiosensitive (those growing fastest) are the first affected by radiation.

Rugh[30] found that mitosis was abruptly inhibited in all cells which had not started the process. Those cells which were in mitosis at the time of irradiation were either able to complete the process or the nuclei and chromatin were so severely damaged that the typical intermitotic "resting cell" stage could not be achieved. He found in the salamander larva (Ambylstoma punctatum) that tissues most resistant to x-ray damage were cartilage and muscle, probably because they were the further developed. The tissue most sensitive to x-ray damage in the larva was that of the central nervous system and the related sense organs. This tissue was the most actively differentiating tissue at the time of irradiation.

Swartz,[31] in a study of humans after excessive radiation exposure, found the most striking biochemical changes are: (1) an increase in urine "corticosteroid-like substances," (2) a prolonged increase in the "adenosine triphosphate" phosphorus in the peripheral white blood cells of a patient given total body x-ray for the treatment of a metastasizing parotid tumor; (3) pronounced terminal increases in urinary coproporphyrin excretion, and (4) increased excretion of "urorosein fraction" pigments in severely ill patients given large doses of total body x-irradiation.

In his animal experiments he[31] found the following: (1) a drop in urinary coproporphyrin excretion followed by a terminal rise; (2) an increased excretion of fecal urobilinogen (indicative of increased red cell destruction); (3) terminal increases in excretion of urinary urobilinogen; (4) increased terminal excretion of kynurenic acid, and (5) increased excretion of uric acid and a decreased uricolytic index.

Other metabolic changes that have been noted[10] show changes in purine and fat metabolism, a biphasic action in carbohydrate metabolism (initial fall of blood sugar for 12 to 24 hours followed by a rise), a rise in respiratory quotient, and a biphasic acid-base action (initial acidosis lasting about 72 hours followed by alkalosis).

Several authors[10, 32] list the radiosensitivity of tissues in the following descending order: (1) lymphoid tissue and bone marrow; (2) epithelial cells (reproductive organs, skin, mucous membrane); (3) endothelial cells; (4) connective tissue; (5) muscle and bone cells, and (6) nerve cells.

Lymphoid Tissue and Bone Marrow: Lymphoid tissue is more sensitive to radiation than is bone marrow, but the more rapidly reproducing lymphoid tissue bounces back faster than does bone marrow. Although the stem cells of both lymphoid tissue and bone marrow appear the same, it would seem from this that the stem cell of lymphoid tissue is more hardy. The lymphocytes are the first cells to show signs of regeneration, as indicated by the increase in their number in the blood. Lymphoid tissue injured by radiation tends to become edematous. These swellings, especially in the throat, ulcerate to become ulcerations common in the oropharyngeal phase of radiation syndrome. The lymphoid tissue in the intestinal tract also swells, producing sanguineous diarrhea, nausea, and vomiting.

Bone marrow changes are mirrored in those changes already mentioned for peripheral blood. They show a type of hypoplasia of the bone marrow. In vitro experiments with both animal and human red cells showed that alpha irradiation caused shrinkage, then swelling, and finally hemolysis. Local irradiation of a part of a single cell resulted in shrinkage of only the irradiated portion. This was followed by swelling of the whole cell and hemolysis.[32]

Ingram,[33] in studying the blood picture of cyclotron workers, found two types of unusual cells. These are early mononuclear cells and bi-lobed or double nuclei lymphocytes. The "early mononuclear cells" are large, peroxidase negative, have deeply basophilic cytoplasm and no nuclei. The "lymphocytes with bi-lobed nuclei" tend to be somewhat larger than typical large lymphocytes with the nuclei stain slightly lighter than the nuclei of the other lymphocytes, but they are similar in consistency and have no nucleoli. The cytoplasm is clear, basophilic, peroxidase negative, and commonly contains a few typical azurophilic granules.

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But both these cells have on occasion been found in workers not associated with the cyclotron project or with any other form of nuclear project.

Marks[34] states, "The most sensitive cellular constituent of the peripheral blood appears to be the lymphocyte, and the reduction in its values closely parallels that of the total number of leukocytes per cu. mm. The morphological changes in the lymphocytes of the peripheral blood after acute total body x-irradiation agree essentially with those seen upon histological examination of the lymphatic tissue in sacrificed animals. With semi-lethal doses, and to a lesser extent after doses below this value, mitosis ceases within an hour and destruction and phagocytosis of lymphatic cells, mainly small and medium lymphocytes, proceeds. 'Blast like' cells are occasionally seen with nuclei which appear to be dissolving. Other lymphocytes appear to have split nuclei and nuclei with considerable fragmentation. During the phase of regeneration in the bone marrow the hetrophiles in the circulating blood of rabbits show a shift to the left following acute total body x-irradiation. Mitrachondrial changes are variable."

Suter[35] also concurs in these various responses of the hematopoietic system to x-irradiation.

Epithelial Cells: The testes showed linings of abnormally large Sertoli cells and hyalinization of the basement membrane. Robinson,[36] in a case of the human testes in which the accurate radiation dosage is not known but exposure was only a fraction of a second to neutron bombardment, found that in three weeks after injury there was no evidence of spermatozoa, and the loss of facial and head hair had occurred. By the 12th to 15th month the spermatogenesis had begun to return.

A rare case is reported[37] in which a male had been sterile for 10 years following irradiation with x-rays and radium as treatment for carcinoma of the rectum. The birth of a daughter to his family indicated the regeneration of the damaged gonadal tissue. It was found on examination that both the child and the father were normal in every respect.

The changes in the ovary are not as striking as those in the testis. There is a change in the ova and also in the menstrual cycle. It is reported[38] that a dose of 2,400 mg. hr. of radium caused amenorrhea for four months, and then the patient became pregnant. There is also an increased incidence of miscarriages and premature births and an increased death rate among expectant mothers.

Pohle[39] found no significant difference in the healing of wounds in the skin in mild or moderate irradiation. Woodburne,[40] in a study of 100 patients receiving irradiation, found such general skin effects as erythema, edema, hyperpigmentation, dryness, atrophic and depigmented skin. Severe cases involving vessels had obliterative vasculitis and consequent ulceration. They urge surgery as soon as feasible for these latter cases. The incidence of epilation has already been mentioned. This epilation seemed to follow the course of ordinary baldness, first involving the front, then the top and back of the head.

Connective Tissue: Jolles,[41] using a sieve (or Chess) method of study, found that the connective tissue reaction takes place not only in irradiated tissue but also in surrounding tissue. The reaction consists of a deposition of an excessive amount of collagenous fibrils which are organized into solid coarse bundles in the exposed parts. Lymphatic channels and blood capillaries are compressed and blocked.

Nerve Tissue: Russel et al.[42] found, on irradiating rabbit brains, that areas of hemorrhage and necrosis formed and that the neurones were only focally and secondarily affected; the meninges and their blood vessels were unaffected; the "superficial parts of the cerebrum suffered no damage, although the cerebellar cortex was in some cases extensively damaged."

A very interesting study[43] was made comparing the physical growth and development of children who survived the Hiroshima and Nagasaki bombing with other Japanese children of the same age. In 1947 the exposed boys were shorter and lighter than the non-exposed boys, but there was slight difference in the exposed and non-exposed girls. Two years later there was no detectable difference between the two groups of girls, but the exposed boys were still shorter and lighter than the unexposed. A year later there was no significant over-all difference. These differences may be attributed to the consequences of total annihilation of the economy of the bombed areas rather than direct effect of the radiation. It may take several generations for the appearance of any mutations which may have occurred. It is highly probable that any mutations which formed would be lethal characteristics and therefore would not be propagated.

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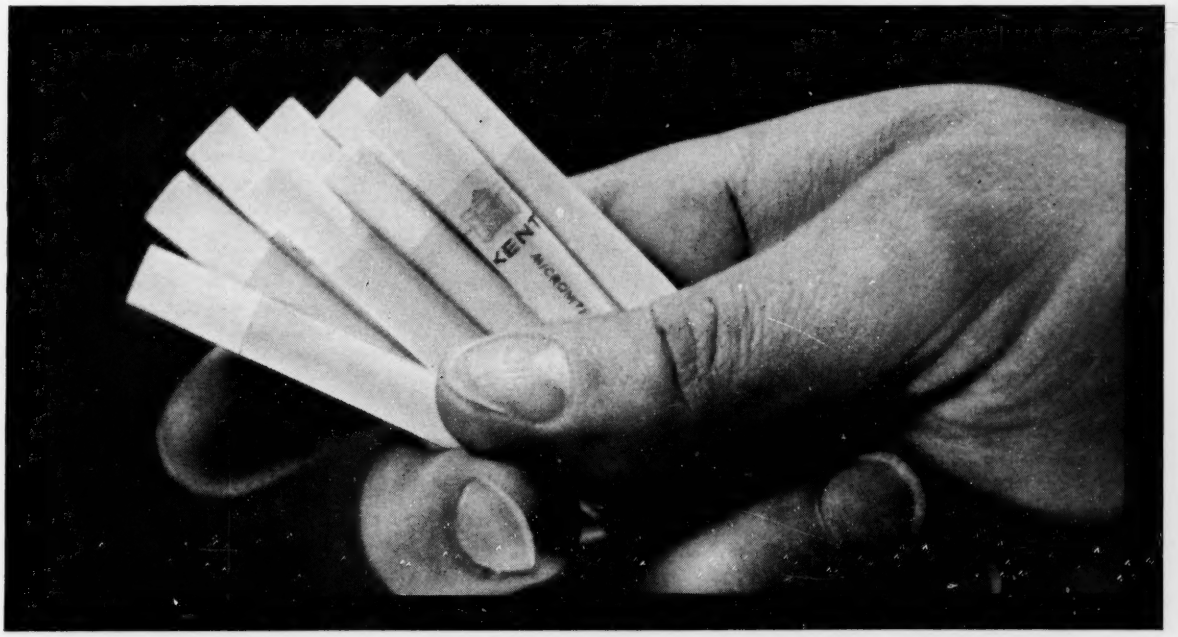

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The seventh annual convention of the International Academy of Proctology will be held at the Plaza Hotel, New York City, March 23-26, 1955. The program will give special emphasis to anorectal presentations and panel discussions. All physicians are invited to attend, regardless of affiliation with the Academy. There is no attendance fee.

The ninth annual seminar in ophthalmology and otolaryngology of the University of Florida will be held at the Sans Souci Hotel, Miami Beach, January 17-22. Lectures on ophthalmology will be presented during the first three days, those on otolaryngology during the last three days.

The Mississippi Valley Medical Society has announced its 1955 essay contest. A cash award of $100, a gold medal, and a certificate of award will be given the author of the best unpublished essay on any subject of general medical interest and practical value. Contestants must be residents of the United States and members of the American Medical Association. Closing date for the contest is May 1, 1955. Details may be secured from Dr. Harold Swanberg, secretary, 209 W.C.U. Building, Quincy, Illinois.

The next examinations for the American Board of Physical Medicine and Rehabilitation will be held in Philadelphia, June 5 and 6, 1955. Final date for filing applications is March 1, 1955. Applications for eligibility should be mailed to the secretary, Dr. Earl C. Elkins, 30 North Michigan Avenue, Chicago 2, Illinois.

A new short course offering expert instruction on the correct way of utilizing "Standard Nomenclature of Diseases and Operations" will be offered at A.M.A. headquarters, Chicago, February 7, 8, and 9. The program will be divided into three parts: (1) lectures covering basic principles, construction, and installation, plus discussion on the tumor and operation sections and the handling of specific problems; (2) anatomy as it pertains to the topographic section, and (3) practice in coding. Registration will be limited to 150.

The Council on Scientific Assembly, American Medical Association, has announced deadlines for

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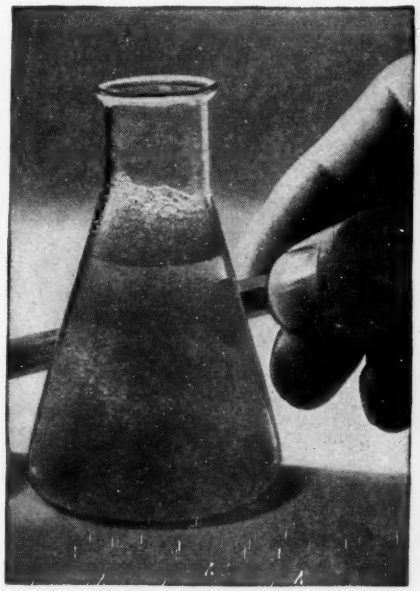

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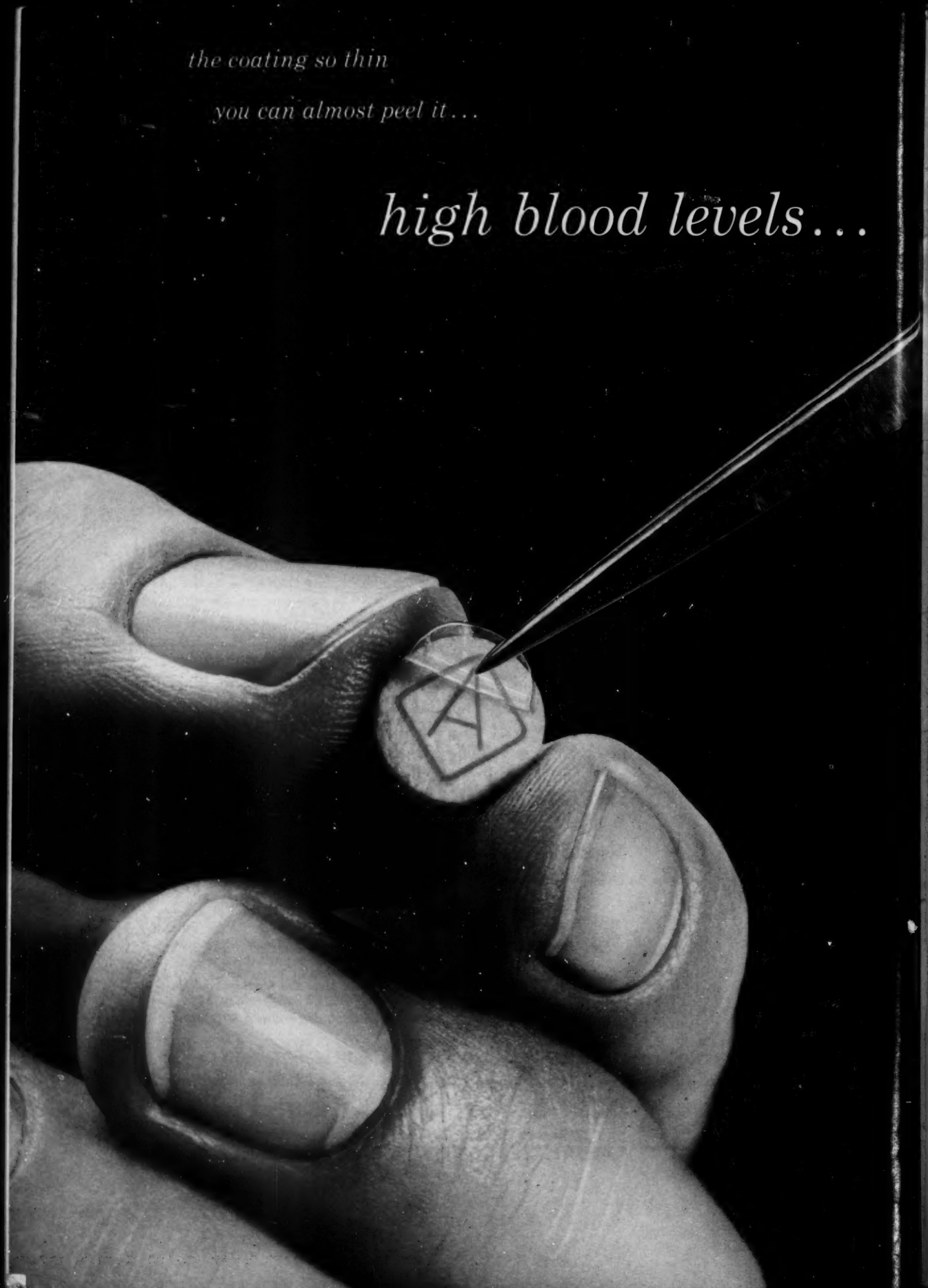

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those who wish to participate in the 1955 meeting of the A.M.A. at Atlantic City. The deadline for those who wish to present section papers is December 15, 1954; for those who wish to present scientific exhibits, January 10. Complete information may be obtained from the Council, A.M.A., 535 North Dearborn Street, Chicago 10, Illinois.

The next scheduled examination (Part I), written examination and review of case histories, for all candidates of the American Board of Obstetrics and Gynecology will be held in various cities on Friday, February 4, 1955. Twenty case abstracts are to be sent to the secretary by each candidate as soon as he receives notification of eligibility to take the Part I examination.

The Sixth American Congress on Obstetrics and Gynecology will be held at the Palmer House, Chicago, December 13-17, under the sponsorship of the American Committee on Maternal Welfare, Inc., and the American Academy of Obstetrics and Gynecology. The program will include 30 formal papers, 22 symposia and panels, luncheon discussion groups, and round-table discussions.

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BOOK REVIEWS

Living with a Disability. By Howard A. Rusk and Eugene J. Taylor. Published by the Blakiston Company, Inc., New York. 207 pages, 275 illustrations. Price $3.50.

This unique book was written by one of the nation's leading authorities on medical rehabilitation in collaboration with a noted lay lecturer in the field of rehabilitation and devices for the handicapped. With the impetus given the rehabilitation concept by the nation-wide interest in the physically handicapped during and following World War II, it was evident to the authors that data relative to devices useful in disabilities must be assembled.

The initial study, the Self-Help Device Research Project, resulted in the publication of several pamphlets in which the fabrication of devices of value in certain types of disability was described. A second study was concerned with evaluation of individual capabilities and limitations in specific disabilities. The present book is the outgrowth of these projects with reference particularly to time-proved devices and suggestions, together with sound advice concerning the psychology of disability and the philosophy of living of those so disabled.

The initial portion of the book concerns the correct assessment of a physical disability. This is measured by a multiplicity of commonplace functions aptly termed "Activities of Daily Living." The clever arrangement of these tests soon narrows the disability to the actual areas in which there is real handicap and in which, therefore, attention must be concentrated in the rehabilitation sense. Sound advice is given regarding the relative advantages and disadvantages of the agencies from which assistive devices may be fabricated whether it be metal, wood, plastic, wire, leather, etc. The devices rather naturally fall into several categories: those concerned with eating, with dressing and physical appearance in general, with bathing and other toilet functions (including valuable sketches of bathroom plans for the wheelchair patient), with writing and similar hand activities, with transportation facilities in the sense of wheelchairs, walkers, and crutches, with kitchen activities for the housewife, with planning the home around the physical disability, with hobbies and relaxation, and finally with those devices useful in keeping the workman on his job. Narration is clear and concise and is certainly held to a minimum. The entire book is profusely illustrated, which is one of the reasons why narration is so conservatively employed.

This book is so unique that it may well become a classic in its field. Physicians who, to state the

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facts bluntly, universally must need to know more of the problems and their solutions in the ever-expanding realm of physical disabilities will glean from this book many things of immediately useful value. Medical students, nurses, physical and occupational therapists, and other paramedical individuals will profit from its contents. Finally, the manner in which the material is presented, together with the modest cost of the book, makes it one which the physician can recommend to the lay individual, handicapped or not. Those who have any dealing with the physically handicapped person will immediately recognize the service rendered by Dr. Rusk and his associates in the compilation of the contents of this book.—*D.L.R.*

Textbook of Pediatrics. Eaited by Waldo E. Nelson with the collaboration of 70 contributors. Sixth Edition. Published by W. B. Saunders Company, Philadelphia. 1581 pages, illustrated. Price $15.

Students of pediatrics are blessed by having two authoritative, complete, and up-to-date textbooks for study and reference. Publication last year of an excellent new edition of an old favorite, Holt's *Diseases of Infancy and Childhood,* threatened a monopoly enjoyed in recent years by the Mitchell-Nelson textbook. This threat has been met by the new Sixth Edition of Nelson's *Textbook of Pediatrics.*

The new edition is a little shorter than the previous one, yet new material has been added and several sections are treated more completely. This has been accomplished by a much-needed tightening of the entire text. The book is made easy for reference by an index which is exceptional for its completeness and legibility. The large section on growth and development, an outstanding feature of the last edition, has been continued with the many tables of physical measurements. These alone make the book a valuable reference work for any physician concerned with the care of children.—*C.A.M.*

America's pharmaceutical industry is spending approximately $60,000,000 a year for research, reports John A. MacCartney of Parke, Davis and Company, who added that new research laboratories have been built, or are planned, by practically every major pharmaceutical manufacturer.

"The reason is two-fold," he said. "The passing years amply demonstrate the fundamental soundness of a heavily-financed and adequately-staffed research installation. Research tends to be a self-perpetuation effort. Each new discovery opens new avenues of problem approach and new vistas of jobs to be done."

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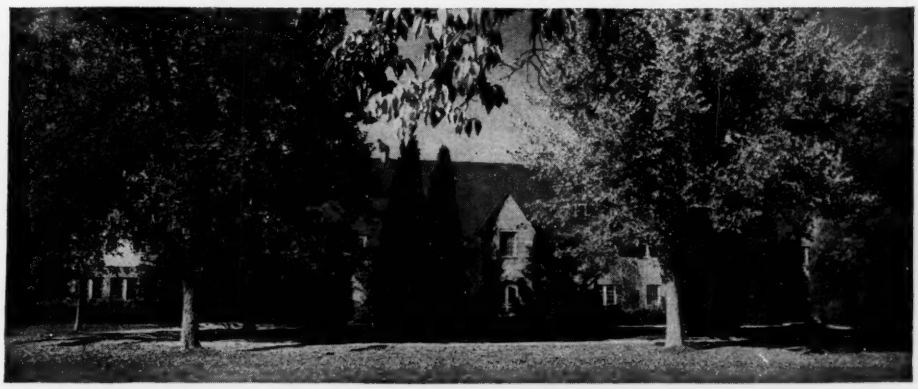

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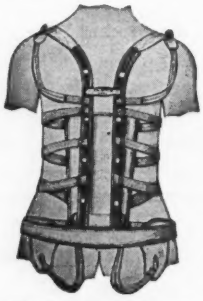

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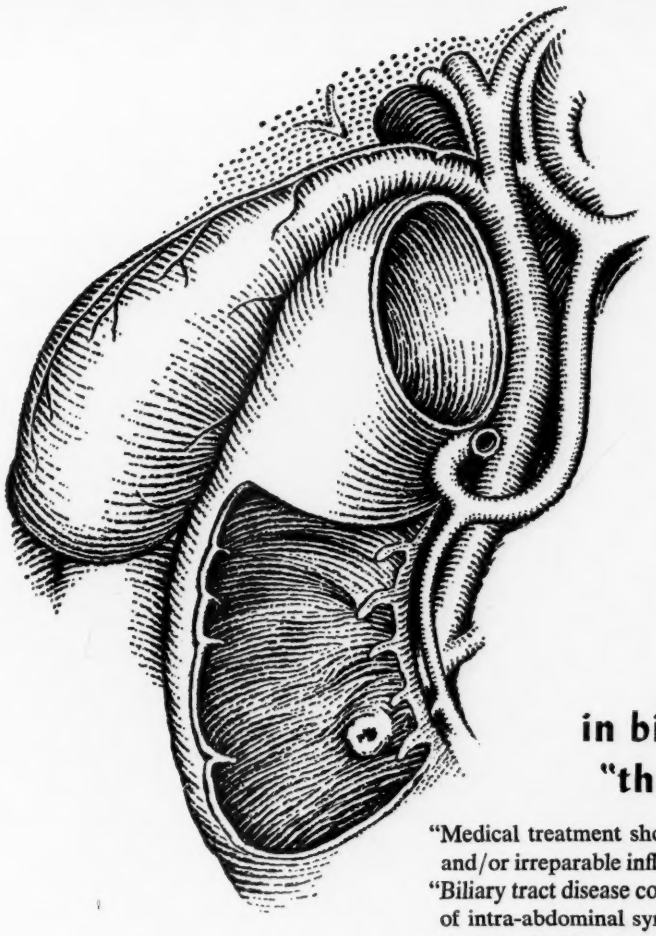

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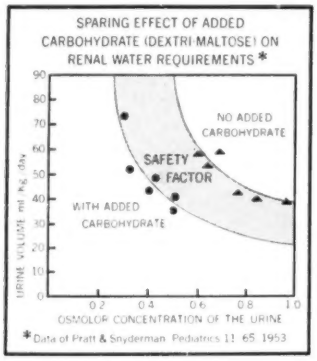
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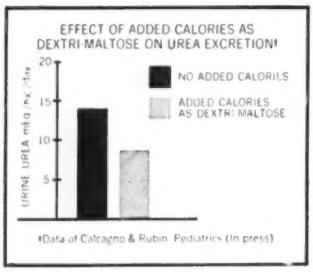
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